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The Interpretive Pathway of Team Decision Making

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by

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ABSTRACT

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Organizations are increasingly making their decisions through multifunctional teams that must interpret, prioritize and discuss an issue to respond to it. Research on achievement goals and framing are each instructive for understanding part of this process. The literature on achievement goals, high-level priorities, is important for understanding team discussions and decisions but it has not found any actionable antecedents to those goals. Studies on frames, cognitive structures, demonstrates that most issues are interpreted as threats or opportunities, which impacts individual and organizational actions. However, framing research does not show how those interpretations impact team priorities or behaviors. The purpose of this dissertation is to merge the two literatures to further both of them and knowledge about team decision making. The theoretical integration suggests that frames activate achievement goals thereby affecting the collaborative behaviors that determine team decision quality. This proposition is tested in an experiment that finds that opportunity framing improves decision quality and increases interdisciplinary collaboration but that it does so through perspective taking instead of achievement goals.

CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

Due to multifunctional teams having larger pools of knowledge (Ilgen, Hollenbeck, Johnson, & Jundt, 2005), organizations are increasingly using them to make decisions on their progressively complex issues (Carroll, Hatakenaka, & Rudolph, 2006; Guzzo, 1986). These issues are not only complicated but they are also ambiguous making teams' interpretations a critical determinant of their firms' responses (Cyert & March, 1963). When their perceptions are insightful, they can develop innovative solutions that create a competitive advantage for their firm (Hambrick & Mason, 1984). But when they are maladaptive, their decisions can cause their company's demise (Argyres, Bigelow, & Nickerson, 2015; Tripsas & Gavetti, 2000).

Achievement goals – a schema for organizing priorities – are an important mechanism that impacts the quality of these decisions by influencing a critical team process, information sharing (Lu, Lin, & Leung, 2012; Matzler & Mueller, 2011; Poortvliet & Giebels, 2012; Poortvliet, Janssen, Yperen, & Vliert, 2007). This implies that if research can find ways to encourage teams to be higher on adaptive achievement goals that it can help improve team decision making.

Unfortunately, my review of the team achievement goal literature did not uncover any easily implementable antecedents. In fact, the only antecedent I was able to find was leaders' achievement orientations (Dragoni & Kuenzi, 2012), which are difficult to change stable traits (Button, et. al., 1996; Heyman & Dweck, 1992). As a result, this research has implications for who should become a leader but it has limited applicability for what leaders should do.

Luckily, the cognitive framing literature can address this shortcoming. It shows that people and organizations use frames as a lens through which they filter and organize incoming information thereby affecting priorities (For a review, see Weick, Sutcliffe, & Obstfeld, 2005). Given that achievement goals are a schema for organizing priorities, this implies that frames

impact team achievement goals. However, the framing literature has not shown how framing impacts team decision processes or qualities.

Together, this suggests that each literature improves the other by addressing a part of teams' interpretative pathways, members working together to make sense of and then to collectively develop a shared prioritization schema that guides their behaviors and choices (Cyert & March, 1963; Daft & Weick, 1984; Lewin, 1958; March & Simon, 1958), that the other literature is yet to address. Framing research tells us about the initial interpretation but not the subsequent team behaviors. And achievement goals research predicts those behaviors but does not address the initial interpretation. To see if these literatures fit together to provide a more holistic understanding of team decision making, this dissertation addresses the following question: does framing impact team behaviors and decision quality through achievement goals?

Answering this question is both practically and theoretically important. From an applied standpoint, understanding the cognitions and motivations that are central to team decision making as well as how to influence them can help mangers improve their teams' decision making. To help with this, I imply that the way that leaders frame an issue impacts the thinking and behaviors that determine their teams' decision quality.

For theory, the answer extends and refines four areas of research. First, it helps extend the team and organization learning literature. The organization learning literature is built on the premise that organizations and teams learn in order to respond to new issues (Cyert & March, 1963) that are mainly framed as threats or opportunities (Mintzberg, Raisinghani, & Théorêt, 1976). However, we do not yet know if the way an issue is framed impacts the extent to which teams engage in a fundamental learning behavior, information sharing. In order to grow our

understanding of framing and learning, I combine those literatures to create a new framework that can be used for studying organizational and team learning.

Second, my dissertation improves the cognitive framing literature (i.e. Dutton & Jackson, 1987) by identifying mechanisms, achievement goals and information sharing, through which these characterizations impact decision making. Moreover, I propose the first empirical test of framing theory at the team level. Given that organizations make decisions through their teams, testing a team level model improves the practical significance of the framing literature.

Third it addresses an important shortcoming in the knowledge diversity literature. As noted by Jackson and Joshi (2011: 674), we know "surprisingly little" about how to get diverse teams to perform well. My dissertation takes a step towards resolving this by showing that opportunity framing encourages knowledge diverse teams to engage in interdisciplinary collaboration, a behavior that is needed for teams to take advantage of their disparate backgrounds (Bunderson & Sutcliffe, 2002a; Pitcher & Smith, 2001).

Fourth, my dissertation furthers our understanding of the antecedents and results of achievement goals by filling important holes in that literature. More specifically, it helps to address three recently identified limitations in that research stream (Dierdorff & Ellington, 2012) by (1) improving our understanding of the results of achievement goals on interdependent tasks, (2) exploring the consequences of team level achievement goals and (3) specifying situational antecedents of team level achievement goals. Moreover, my dissertation overturns the belief that performance goals undermine collaboration (Janssen & Prins, 2007; Poortvliet & Darnon, 2010; Poortvliet & Giebels, 2012; Poortvliet et al., 2007; VandeWalle & Cummings, 1997; VandeWalle, Ganesan, Challagalla, & Brown, 2000) by showing that performance-approach goals increase information sharing when teams must engage in it to perform well.

Before making these contributions, the phenomena and context of interest should be defined. Team decision making is the process through which three or more individuals come to a consensus on a choice (Kerr & Tindale, 2004; McGrath, 1984). For the sake of clarity, there are a two aspects of this definition that should be highlighted. First, team decision making must involve groups making a choice suggesting that simply brainstorming possible options is not decision making unless it is followed by making a selection. Second, this process ends when a decision is made. In other words, it does not involve implementation.

Similarly, decision making teams are teams that must reach a consensus on but not necessarily execute a plan of action (De Dreu & Weingart, 2003; Devine, 2002; McGrath, 1984). Due to environments and organizations being complex, these teams typically have members with deep understandings of different functional areas that can be combined to better comprehend an issue (Eisenhardt & Bourgeois III, 1988; Lawrence & Lorsch, 1967a). Consistent with this reality, I focus on multifunctional decision making teams.

Even more specifically, my theory focuses on how these teams react when they are presented with an exogenous change. Following precedent, an external change is defined as an event that has the potential to disrupt the "shared understandings that support continuation of the established pattern" (Romanelli & Tushman, 1994: 1143).

In order to develop a model that helps multifunctional decision making teams adapt to change, I turn to a review of the achievement goal literature followed by a review of the cognitive framing literature. I then conclude this chapter by restating the purpose and explaining the structure of this dissertation.

ACHIEVEMENT GOALS

Research on achievement goals was initially conducted to further our understanding of the cognitive and motivational drivers of scholastic achievement (Dweck & Reppucci, 1973). Over the course of many studies a basic model emerged where aspects of students' classrooms (Ames, 1992; Ames & Archer, 1988) impact their achievement goals thereby determining the nature and amount of their motivation. This, in turn, influences students' engagement in and approach to their studies, which ultimately shape their scholastic performance (Elliot & Harackiewicz, 1996).

Likely due to the robustness of this model, interest in it expanded beyond educational psychologists to include management scholars as well. These researchers have established that achievement goals impact where employees direct their attention, the type and amount of motivation individuals and groups feel as well as a host of important work outcomes (For reviews, see DeShon & Gillespie, 2005; Dierdorff & Ellington, 2012; Dragoni & Kuenzi, 2012).

Management scholars tend to conceptualize achievement goals in ways that can be classified using a two-by-two framework. More specifically, the construct is defined as goals or orientations that are at the group or individual level (DeShon & Gillespie, 2005). At the individual level, achievement goals are the "purpose or cognitive-dynamic focus" used while engaging in a task (DeShon & Gillespie, 2005; McGregor & Elliot, 2002: 381) and orientations are thought of as dispositions that are responsible for differences in behaviors across situations (DeShon & Gillespie, 2005). In other words, goals are a state and orientations are a trait.

When these individual level concepts are extrapolated to the group level, goals simply become the shared prioritization and focus of a group (Ames, 1992; Ames & Archer, 1988; Dragoni, 2005). Unlike the previous three types of conceptualizations, group orientations tend to be thought of in two distinct ways. First, some scholars define them as the collection of team

members' trait orientations (Pieterse, van Knippenberg, & van Ginkel, 2011). Others think of them as aspects of a team's environment "that signal the goals and behaviors that are desired, emphasized, or rewarded in the context of a particular group" (Ames, 1992; Bunderson & Sutcliffe, 2002b; Bunderson & Sutcliffe, 2003: 553; Dragoni & Kuenzi, 2012).

For the remainder of this dissertation, I will focus primarily on team achievement goals, because the phenomena of interest is a particular situation, teams making decisions, and goals are situation specific. Research shows that these goals fit into two broad types, "a performance goal focused on the demonstration of competence relative to others, and a mastery goal focused on the development of competence and task mastery" (Elliot & Church, 1997: 218). In other words, mastery goals are associated with being motivated by understanding the task itself. But performance goals are associated with being driven by an extrinsic outcome (Elliot & Harackiewicz, 1996). When people focus on results, they tend to conceptualize them in terms of a relative reference point, which is either positive or negative (Kahneman & Tversky, 1979). This infers that individuals or teams focusing on performance goals are either trying to be successful or attempting to avoid failure (McClelland, Atkinson, Clark, & Lowell, 1976). Thus, scholars typically distinguish performance goals along those lines defining performance-approach goals as concern for achieving positive outcomes and performance-avoidance goals as concern for preventing negative outcomes (Ames & Archer, 1988; DeShon & Gillespie, 2005; Elliott & Dweck, 1988; Elliot & Harackiewicz, 1996; Vandewalle, 1997).

It is worth mentioning that these goals should be thought of as dimensions of priorities and motives instead of as mutually exclusive states (Heyman & Dweck, 1992). In other words, they are a schema for organizing and assigning weights to wants that allow for teams to be high or low on a combination of achievement goals (Button et al., 1996). For example, an individual or

team that wants to understand a task and do better than others on it is high on mastery and performance-approach goals. But a person or group that is apathetic about its work is likely to be low on all achievement goals.

Research also demonstrates that groups of people in similar situations have similar achievement goals (Ames, 1992; Ames & Archer, 1988; Dragoni & Kuenzi, 2012; Kim, Kim, & Svinicki, 2012). This work is rooted in demonstrating how differences in classroom environments are tied to the type of achievement goals students adopt (Ames, 1992; Ames & Archer, 1988; Church, Elliot, & Gable, 2001). It shows that as classmates interact, they tend to adopt similar perceptions of their environment resulting in them having similar achievement goals (Ames, 1992; Ames & Archer, 1988; Church et al., 2001).

A parallel process is shown to unfold at work; Bunderson and Sutcliffe (2002b) demonstrate that similarities in the nature of groups' work and context result in members feeling that certain achievement goals are prioritized, which determine the goals they adopt. Members perceptions of their group become more homogenous as members discuss them, which further increases the within group similarity of members' achievement goals. Moreover, motivations tend to be contagious (Friedman, Deci, Elliot, Moller, & Aarts, 2010; Levine, Higgins, & Choi, 2000); a member displaying behaviors consistent with an achievement goal cause that goal to spread throughout a team (Friedman et al., 2010) further suggesting that achievement goals are homogenous within teams.

This within group homogeneity combined with the between team differences discussed below implies that achievement goals should be conceptualized at the team level when describing them in the context of team decision making (Klein, Dansereau, & Hall, 1994). Consistent with this logic, I propose the following three definitions. First, *team state mastery*

goals represent team members' shared focus on developing an understanding of the team's situation. Second, *team state performance-approach goals* are team members' shared desire for the team to perform better than other teams. Third, *team state performance-avoidance goals* are defined as team members' shared desire to prevent a poor outcome relative to other teams.

Of these goals, team mastery state goals are the most studied and have been shown to be positively related to important team decision making behaviors and outcomes. Mastery goals increase a team's engagement in adaptive behaviors (LePine, 2005) and open discussion (Beckmann, Wood, Minbashian, & Tabernero, 2012). As a result, team mastery goals are positively related to a team's decision improvements (Porter, Webb, & Gogus, 2010), value creation (Bereby-Meyer, Moran, & Unger-Aviram, 2004), satisfaction (Kristof-Brown & Stevens, 2001) and quality (Beckmann et al., 2012).

While team performance goals have received less attention, research shows that they lower helpful team decision making behaviors and outcomes. More specifically, they decrease adaptive behaviors (LePine, 2005) and open discussion (Beckmann et al., 2012). The result is poorer decisions (Beckmann et al., 2012; Porter, 2005) and smaller improvements in decision quality of over time (Porter et al., 2010).

Despite performance-approach and performance-avoidance goals resulting in differences in a wide range of behaviors and outcomes across contexts (for a meta-analytic review, see Cellar et al., 2011; Elliot & Harackiewicz, 1996; Elliot, McGregor, & Gable, 1999), there is only one team decision making paper that makes this distinction. That paper finds that performance-approach goals increase a team's involvement in planning thereby improving their decisions (Mehta, Feild,

Armenakis, & Mehta, 2009). The results of performance-avoidance goals are inconclusive[1].

Even though mastery and performance goals have been associated with important team decision behaviors and outcomes, my review of the achievement goal literature finds that there are not any actionable and empirically tested antecedents of groups' achievement goals. The framing literature discussed next has the potential to address this shortcoming and improve the practical significance of the team achievement goal literature.

COGNITIVE FRAMING REVIEW

Research finds that the way a situation is characterized impacts how people react (Daft & Weick, 1984; Gilbert, 2005, 2006; Weick, 1988) as well as the information they absorb (Salancik & Pfeffer, 1978). When people, teams and organizations are faced with a complex or ambiguous issue, one of the primary ways they make sense of it is by labeling it and continuing to apply the same label to it (Tsoukas & Chia, 2002; Weick et al., 2005). Labels recruit mental schema that help to "make sense of equivocal inputs and enact this sense back into the world to make that world more orderly" (Weick et al., 2005: 410).

The process through which labels are selected and applied is called framing. Scholars understanding of framing has its roots in research on the behavioral theory of the firm (Cyert & March, 1963; March & Simon, 1958) and sensemaking (Weick, 1979). These literatures define frames as "knowledge structures that help individuals to organize and interpret incoming perceptual information by fitting it into already available cognitive representations from

[1] It also bears noting that the results of achievement goals are task dependent. Thus, a goal that is beneficial in a particular circumstance may be harmful in another. My dissertation focuses on team decision making, which is a complex task. By grounding my theory in a specific task, I am intentionally limiting the generalizability of my model to improve its accuracy (Lawrence & Lorsch, 1967b). For example, my dissertation implies that team performance-avoidance goals are generally harmful for team decision making. But they are not universally detrimental for all tasks. For instance, they are associated with increased concern over making mistakes resulting improved performance on simple detail-oriented tasks (Mauro, Pierro, Mannetti, Higgins, & Kruglanski, 2009).

memory" (Cornelissen & Werner, 2014: 189). Likely due to frames being essential to comprehension (Starbuck & Milliken, 1988; Weick, 1995), people and organizations usually activate these knowledge structures shortly after they are presented with ambiguous circumstances (Gavetti & Levinthal, 2000; Weick, 1993). Furthermore, there is not a one-to-one link between situations and their frames; the frame selection process is history dependent (Whiteman & Cooper, 2011) and can be influenced by others (Christianson, Farkas, Sutcliffe, & Weick, 2009).

Similarly, research suggests that many different frames can co-exist for a given business situation. For example, research on changes to the newspaper (Gilbert, 2005, 2006), semiconductor (Burgelman, 1991, 1994), and photography (Tripsas & Gavetti, 2000) industries shows that there is not a common characterization of a strategic circumstance within most companies. However, leaders can influence the frames their subordinates apply. For example, leaders at a museum strategically used frames to impact the options people considered and the manner they went about developing new routines (Christianson et al., 2009).

While every attempt to use framing is unlikely to be this impactful, there are two aspects of the sensemaking process that are particularly important for discerning how successful an attempt will be. First, individuals attempt to categorize an issue early (Weick, 1993) and the categorization determines how subsequent information is processed (Salancik & Pfeffer, 1978). This makes categorizations hard to change once they have been applied (Weick, 1979). Second, the weight given to information about how a situation should be characterized is a function of how credible the source is (Weick, 1993). Thus, attempts to influence characterizations will be more effective when they are made earlier in the sensemaking process by a credible person (Dutton, 1992). If a credible person labels an ambiguous situation, others tend to use the same

label as well (Dutton & Jackson, 1987). Over time, interacting individuals tend to characterize a situation similarly (Dutton, 1992; Dutton & Jackson, 1987). Thus, the way a credible person labels an ambiguous situation to a team early in the sensemaking process is likely to impact the way a team collectively characterizes it thereby impacting subsequent cognitions and behaviors (Salancik & Pfeffer, 1978; Weick et al., 2005).

Moreover, there are two frames that are likely to resonate with teams making a decision, threats and opportunities (Jackson & Dutton, 1988; Mintzberg, et. al., 1976; Nutt, 1984), because human survival instincts make people inclined to use them (Elliot & Reis, 2003). *Opportunity framings* are defined as explanations where gains are more salient and *threat framings* are explanations where losses are more salient. As noted by Dutton and Jackson (1987), these framings are similar to those used in prospect theory (Kahneman & Tversky, 1979); opportunity framings are akin to potential gain situations while threat framings are similar to potential loss situations. Each of these frames recruit different psychological processes, resulting in different behaviors (Weber, Mayer, & Macher, 2011).

Opportunity framing increases peoples' feelings of control (Taylor & Armor, 1996), optimism (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000) and willingness to change (Dutton, 1992). As a result, when people use opportunity frames, they are more likely to learn about their situation (Taylor & Armor, 1996) and act creatively (Higgins, 1998). When applied to the organizational level, opportunity frames result in changes to routines (Gilbert, 2005).

Threat framings, on the other hand, increase the extent to which people want to disassociate with an issue (Dutton & Jackson, 1987) as well as their sense of urgency (Gilbert, 2006). Paradoxically, research shows that threat framing results in people becoming more detail oriented (Higgins, 1998; Roney & Lehman, 2008) and prone to risk taking (Dutton & Jackson,

1987). At the organizational level, this manifests into companies being more likely to change their procedures (Chattopadhyay, Glick, & Huber, 2001) and how resources are distributed (Gilbert, 2005).

While research has uncovered some insights into how opportunity and threat framings impact organizational and individual outcomes, scholars have not explored how framing impacts teams' decisions or the behaviors that impact the quality of those decisions (for reviews, see Cornelissen & Werner, 2014 as well as Maitlis & Christianson, 2014). Because decision making teams' responses to changes are critical determinants of organizational responses, the framing literature should be expanded to include them.

MERGING ACHIEVEMENT GOAL AND FRAMING THEORIES

The purpose of this dissertation is to merge the achievement goal and framing literatures to develop a more holistic and actionable team decision making model. Moreover, combining these literatures addresses a limitation in and improves the practical significant of both of them. Achievement goal research predicts the team behaviors that impact decision quality but has not found an actionable antecedent to those goals. Framing, on the other hand, is a driver of individual and organizational priorities and actions but has not been shown to effect team behaviors or decision making. As a result, developing a model where frames impact team achievement goals thereby affecting team behaviors and outcomes provides team achievement goals with an actionable antecedent and framing with a team level model. While merging these literatures can improve them, a natural question still remains - why not focus on another antecedent to achievement goals or another team cognition for framing to impact?

The answer is that achievement goal and framing theories have similar theoretical roots making their integration more intuitive. The other cognitive mechanism studied in team decision

making, emotions (for a review, see De Dreu, Nijstad, & van Knippenberg, 2008), have different theoretical roots making them less appealing consequences of framing. In terms of the antecedents for team achievement goals, the two forms that are the most studied in the team decision making literature, team member characteristics and task structure, are out of the control of most leaders (Graen, Cashman, Ginsburg, & Schiemann, 1977). As a result, building a model where they influence team achievement goals would be less actionable.

In order to more fully merge the theoretical cousins of achievement goals and frames, I develop a series of hypotheses in the next chapter. In Chapter 3, I discuss how I tested the model using a laboratory simulation. In Chapter 4, I review the largely unsupportive results from the experiment and discuss a more empirically valid one that emerged. And in the last chapter, I provide reasons why my model was not supported and discuss how the supported model advances theory and helps practitioners.

CHAPTER 2: THEORY AND HYPOTHESES

As I just suggested, integrating research on opportunity framing with that on performance-approach goals is fairly straightforward because both constructs are grounded in prospect theory and creating gains (Dutton & Jackson, 1987; Elliot, 1999; Kahneman & Tversky, 1979). Opportunity frames stress positive outcomes relative to a reference point. And when people are focusing on creating gains to get above a reference point, they are taking performance-approach goals. This implies that opportunity framing should result in teams being higher on performance-approach goals.

That link has important ramifications for behaviors; the higher individuals' performance-approach goals, the more they do what is needed to get a favorable outcome (Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001). For instance, students higher on performance-approach goals engage in more test directed studying (Elliott & Dweck, 1988; Elliot & Harackiewicz, 1996; Elliot et al., 1999).

This suggests that groups' performance-approach goals should be positively related to their willingness to do what is needed to succeed. For the focal context, multifunctional decision making teams, information sharing is one such necessary behavior. Information sharing "involves conscious and deliberate attempts on the part of team members to exchange work-related information" (Bunderson & Sutcliffe, 2002b: 881). And it is a critical determinant of decision making teams' success because these teams must synthesize all the information at their disposal to figure out how to react to change (Eisenhardt, 1989; for a meta-analytic review, see Mesmer-Magnus & DeChurch, 2009).

While the broad construct of information sharing is an essential driver of decision making teams' success, there are two subtypes that are likely to be particularly important. First,

interdisciplinary collaboration, members discussing their "unique knowledge sets for the teams' benefit" (Mesmer-Magnus, DeChurch, Jimenez-Rodriguez, Wildman, & Shuffler, 2011: 215), is imperative; multifunctional decision making teams have representatives from different parts of the organization who must find ways for their divisions to productively interact (Eisenhardt & Bourgeois III, 1988; Lawrence & Lorsch, 1967a). Second, voice, the "expression of challenging but constructive work-related opinions, concerns, or ideas" (Tangirala & Ramanujam, 2008: 1189), is critical because it is the central mechanism through which teams check the accuracy of their information (Morrison & Milliken, 2000). The costs of incorrect information can be enormous when teams are trying to solve interdependent problems (Nickerson & Zenger, 2004) such as making strategic decisions.

In sum, team decision making is aided by engaging in information sharing, interdisciplinary collaboration and voice. Given that teams higher on performance-approach goals are more likely to do what is needed to succeed, those teams should have more participation in those collaborative behaviors. Moreover, opportunity framing focuses teams' collective attentions on positive outcomes, which is akin to being higher on performance-approach goals. Thus, opportunity framing increases team decision making quality through augmenting teams' performance-approach goals thereby increasing the extent to which members engage in information sharing, interdisciplinary collaboration and voice. Stated formally:

Hypothesis 1. *There are positive indirect relationships between opportunity framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team performance-approach goals.*

Hypothesis 2. *There are positive indirect relationships between team performance-approach goals and team decision making quality through team (a) information sharing, (b)*

interdisciplinary collaboration and (c) voice.

Unlike performance-approach goals that are directed towards success, performance-avoidance goals are aimed at avoiding failure. When team members internalize this concern, they become more fearful (Chalabaev, Major, Cury, & Sarrazin, 2009) and try to escape the situation (Elliot & Harackiewicz, 1996). And when people feel this way, they do not share information (Kish-Gephart, Detert, Treviño, & Edmondson, 2009). Thus, team state performance-avoidance goals should have a negative association with team information sharing thereby harming team decision making quality.

Moreover, threat framings are likely to increase the extent to which teams adopt performance-avoidance goals because threat framings increase the salience of negative consequences. And when teams are focusing on avoiding harmful outcomes, they are adopting performance-avoidance goals. In short, framing new and ambiguous information as a threat should decrease the extent to which teams engage in information sharing by increasing their performance-avoidance goals with the ultimate outcome being poor decision making. Stated formally:

Hypothesis 3. *There are negative indirect relationships between threat framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team state performance-avoidance goals.*

Hypothesis 4. *There are negative indirect relationships between team performance-avoidance goals and team decision making quality through team (a) information sharing, (b) interdisciplinary collaboration and (c) voice.*

Each framing directs attention away from the outcome the other framing stresses (Dutton & Jackson, 1987; Jackson & Dutton, 1988). In particular, opportunity framings take focus away

from negative outcomes. And when teams are not focusing on negative outcomes, they are lower on performance-avoidance goals that squelch information sharing.

Threat framings, on the other hand, take attention away from positive outcomes. And when teams are less focused on obtaining positive outcomes, they are lower on performance-approach goals which encourage information sharing. Thus, threat framings should reduce information sharing by lowering teams' performance-approach goals and opportunity framing should increase information sharing by lowering performance-avoidance goals. Stated formally:

Hypothesis 5. *There are positive indirect relationships between opportunity framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team state performance-avoidance goals.*

Hypothesis 6. *There are negative indirect relationships between threat framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team state performance-approach goals.*

While performance-approach and performance-avoidance goals are the result of how much people focus on positive or negative outcomes, mastery goals are related to feelings of control (Dweck, 1986, 1996). And a variety of research suggests that opportunity framing will increase peoples' feelings of control. For example, the cognitive appraisal literature shows that people think they are more able to impact a situation when they appraise it more positively (Lazarus & Launier, 1978). Research on cognitive biases also shows that people who focus on positive outcomes feel they have more influence over their fate (Langer & Roth, 1975). Moreover, studies on managerial decision making find that managers feel more in control when they think that a situation is an opportunity (Fredrickson, 1985; Mintzberg et al., 1976).

People prioritize learning about their situation when they feel in control of it (Dweck &

Reppucci, 1973). The basic logic behind this finding is that individuals feel that learning about their situation is helpful when they think they can impact it. But they tend to think that learning is futile when they feel unable to influence their circumstances (Dweck, 1986). Thus, opportunity framing increases mastery goals by increasing members' feelings of control.

Moreover, previous research suggests that team mastery goals result in more information sharing (Bunderson & Sutcliffe, 2002a, 2003). These studies show that people with mastery orientations view others as potential resources for improving their understanding and competence (Poortvliet & Darnon, 2010). As a result, they engage in collaborative activities (Poortvliet & Darnon, 2010; Poortvliet & Giebels, 2012). For example, previous research finds that people with mastery orientations share more information (Lu et al., 2012; Poortvliet & Giebels, 2012) and seek more feedback (VandeWalle & Cummings, 1997; VandeWalle et al., 2000). Given that achievement goals are more strongly related to behaviors than orientations (Dweck, 1992), team mastery goals and information sharing should be positively related.

In sum, opportunity framings make team members feel more in control thereby increasing their mastery goals. In decision making teams, developing mastery of a situation is done through sharing information which also improves decision making quality. Thus, opportunity framing should increase teams' information sharing and decision making quality by increasing teams' mastery goals. Stated formally:

Hypothesis 7. *There are positive indirect relationships between opportunity framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team mastery goals.*

Hypothesis 8. *There are positive indirect relationships between team state mastery goals and team decision making quality through team (a) information sharing, (b) interdisciplinary*

collaboration and (c) voice.

The more people focus on negative consequences and ignore potentially positive ones, the more they feel helpless (Dweck & Reppucci, 1973; Elliot & Reis, 2003). And when individuals feel this way, they do not adopt mastery goals because they do not see the point in learning (Diener & Dweck, 1980; Dweck & Reppucci, 1973).

Because threat framings increase the salience of negative outcomes at the expense of positive ones (Dutton & Jackson, 1987; Jackson & Dutton, 1988), this suggests that teams that have changes introduced with a threat framing should also feel more helpless (Dutton, 1992). As a result, they will also be lower on team mastery goals. Given that previous research implies that mastery goals are positively associated with information sharing, I suggest the following hypothesis:

Hypothesis 9. *There are negative indirect relationships between threat framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team mastery goals.*

My argument up to this point hypothesizes that team achievement goals will impact decision quality through information sharing. However, these relationships may not be so simple, because teams need to balance learning with task completion in order to do well. This implies that the relationships between team success and achievement goals is curvilinear (Bunderson & Sutcliffe, 2003) or moderated (Porter et al., 2010). However, most papers propose un-moderated linear relationships between team achievement goals or orientations and performance (For reviews, see Dierdorff & Ellington, 2012 as well as Kim et al., 2012). Moreover, this literature tends to conceptualize mastery, performance-approach and performance-avoidance goals as being mutually exclusive, which they are not. Instead, achievement goals are different

dimensions of the superordinate goals that people hope to achieve (Button, Mathieu, & Zajac, 1996; Farr, Hofmann, & Ringenbach, 1993; Heyman & Dweck, 1992). As a result of these oversights, research on team achievement goals is yet to test the results of teams being high on both performance-approach and mastery goals[2]. This interaction may predict the teams that make the best decisions because teams that are high on both goals may balance learning with making timely decisions.

When teams are high on mastery goals but low on performance-approach goals, they may be overly focused on learning and not direct enough attention towards coming to a decision. When teams wait too long to work toward task completion, they do not engage in some of the behaviors that are needed to come up with good solutions (Gersick, 1988).

When teams are high on performance-approach but low on mastery goals, the opposite may happen; they may exert too much effort into task completion and not enough effort into learning about the complex issue they are resolving (Winters & Latham, 1996), which also leads to suboptimal decision making.

However, when teams are high on both mastery and performance-approach goals, they are concerned with understanding the information and coming to a decision. As a result, these teams will achieve a better balance between engaging in learning and executing thereby improving their decision making quality. Stated formally:

Hypothesis 10. *Team state mastery and team state performance-approach goals will interact in their relationship with decision making quality. Teams that are high on both team state mastery and performance-approach goals will make the best decisions.*

[2] The closest is Porter, et. al. (2010), who tested the three way interaction between performance and learning orientations as well as slack resources on performance improvements in a command and control experiment.

It is worth noting that I just argued that the reason teams high on performance-approach and mastery goals will make sound decisions is that they will be engaging in learning and non-learning behaviors. Given that information sharing is a team learning behavior (Edmondson, Dillon, & Roloff, 2007), this implies that the interaction between team state mastery and performance-approach goals that is associated with better decision making will be partially mediated by information sharing. Stated formally:

Hypothesis 11. *(a) Information sharing, (b) interdisciplinary collaboration and (c) voice will partially mediate the effect that the team mastery by performance-approach goal interaction has on team decision making quality.*

CHAPTER 3: DESIGN AND METHOD

Methodology Overview

The model was tested using a group experiment for two primary reasons. First and most importantly, the model is causal in nature and experiments are better suited for testing causal arguments (Rosenthal & Rosnow, 2007). Second, testing many of my hypotheses requires capturing goals and behaviors simultaneously. Doing this in a field setting would be plagued by common method bias. On the other hand, lab settings allow me to survey members on their goals as well as to have objective 3rd party coders quantify their behaviors.

The task was a three-round management simulation called Tinsel Town where three person multifunctional teams made decisions about what movies a studio should make and how much they should spend on marketing them (Devine, Habig, Martin, Bott, & Grayson, 2004). The design had three conditions (no framing, opportunity framing and threat framing).

Primary Experiment

Subjects. The primary experiment used 180 subjects from Washington University in St. Louis. This number was used to adhere to the results of power analysis and published guidelines. For the former, I used G-power (Faul, Erdfelder, Lang, & Buchner, 2007), a statistical package for experimental designs, and made the following assumptions. I set α to .05 because that is the standard cut-off for statistical significance. I conservatively assumed the Cohen's *f* would be .4; the most similar experiment (Gump & Kulik, 1997) found a Cohen's *f* of .49. These inputs result in 42 teams (14 teams/ cell) being required for a power of .8. Given that the procedure uses 3 person teams, 126 individuals would have been needed.

Despite this large number, it was actually below Simmons, Nelson, and Simonsohn's (2011) recommendation that 20 observations per cell be used. Following their recommendation results

in 60 teams or 180 people being needed, which is the amount of subjects I used.

Experimental task: Tinsel Town group decision making simulation. The focal task was a group decision making simulation where "participants represent the top management team of a fictional Hollywood movie studio. The group's overall goal is to maximize cumulative profit over three simulated years (i.e., decision periods) by choosing screenplays to produce and setting corresponding marketing levels for each film" (Devine et al., 2004: 94)[3]. In it, each member represents a different part of a fictional movie studio where each member gets some shared and some unique information. The decision quality is quantified by a series of algorithms and each member gets some information about some of the algorithms.

Experimental procedure. The procedure consisted of ten primary steps. Before arriving at the lab, subjects were asked to take a survey that consists of questions used for controls and inputs for exploratory analysis. When they arrived at the lab, they were asked to join a group with two other participants. Next, participants received separate information sheets. Fourth, they read their sheets separately. Fifth, they worked together to select the movies and marketing budgets for the first round. Next, they turned their sheets in and got their score for the first round. Sixth, they again selected a movie combination and got feedback on it. After that, they all received a memo from the CEO that told them that a new technology entered the movie industry, IMAX screens. Each subject also received separate information about how IMAX screens change some of the assumptions they were told at the beginning. Combined, the handouts had the information that was needed for them to quantify the impact that IMAX screens had on the expected profit of each movie. Thus, subjects had an opportunity to learn about IMAX's impact. And they needed to incorporate this information into their decision making

[3] Special thanks to Amanda L. Thayer for the recommendation and Dennis J. Devine for providing the simulation for free.

process in order to make sound decisions. Moreover, the introduction of IMAX screens was an exogenous change in that it required that teams change the way they selected movies. Eighth, they selected movies, chose rather to make them in IMAX or not and their marketing levels. Ninth, they took surveys about their achievement goals. And finally, they were debriefed and given their score in the final round. The procedure took roughly one and a half hours.

Manipulations. The experiment has three conditions (opportunity framing, threat framing and no framing). The framing manipulation was administered by changing the wording of the last few sentences of the memo from the CEO about IMAX theatres as follows:

> *No framing:* IMAX screens are likely to require you to make changes to your strategies.
>
> *Opportunity framing:* IMAX screens are a real opportunity for you if you make the right decisions. Please think about how you should change your strategy so that you can make more money next year than you did this year.
>
> *Threat framing*: IMAX screens are a real threat to you if you make the wrong decisions. Please think about how you should change your strategy so that you don't make less money next year than you did this year.

It is worth noting that the framing manipulations lined up with the definitions of the different framings. First, opportunity framings are defined as explanations where gains are more salient. In the opportunity framing manipulation, subjects were told that IMAX screens were an opportunity and that there was a possibility of making more money. Second, threat framings are explanations where losses are more salient. For that manipulation, subjects were told that IMAX screens were a threat and making less money was possible.

Measures. In order to quantify the constructs in my model, they were measured in two primary ways – questionnaires and video coding. The questionnaires were administered at two

points – before subjects arrived at the lab and after task completion.

In both surveys, I captured participants' achievement goals and orientations in a manner consistent with the advice of Hulleman, Schrager, Bodmann, and Harackiewicz (2010). In their meta-analysis, they found that different achievement goal measures captured different underlying constructs. As a result, the authors recommended that scholars use measures that are consistent with the way that the achievement goals are defined (Hulleman et al., 2010). I used the measures they recommend for the way I defined achievement goals.

Before arriving, some of the constructs that can be used for control variables and exploratory analysis were measured. One such measure was the participants' trait achievement orientations, which I used a slightly modified version of VandeWalle, Cron, and Slocum's (2001) measures to capture. More specifically, I made their items about general tendencies instead of classroom behavior so that they captured global traits (DeShon & Gillespie, 2005). Their scales have four items for each construct where subjects are asked the extent to which they agree or disagree with a statement (1 = strongly disagree, 7 = strongly agree). The specific items and their loading as well as their reliability in Table 1.

I used factor analysis to verify that the achievement orientation measures are getting at distinct constructs. From the Exploratory Factor Analysis (EFA), the convergent and discriminant validity was evaluated based on the eigenvalues, which are "the variance in the indicators explained by the successive factors loadings" (Brown, 2006: 25). The eigenvalues were above the typical cutoff of 1 (eigenvalues = 3.07, 2.70, 2.58; 64% of the variance explained) indicating that the scales were three clean factors. Items loaded on factors as predicted by VandeWalle et al.'s (2001) theory (average predicted loading = .77, min = .59, max = .89) with minimal cross-loadings on other factors (average cross-loading = .02, min = -.29,

max = .45). Also, all three scales demonstrated adequate reliability (mastery orientation $\alpha = .80$, performance-approach orientation $\alpha = .79$, performance-avoidance orientation $\alpha = .89$)

Because this is a cognitively difficult task, I asked participants for their GPA. In case their amount of education helps them in making these decisions, I asked them for their expected graduation date.

After the task, their state achievement goals were measured. While this is an issue for causal order, I chose to survey achievement goals at the end of the task instead of immediately after the manipulation to prevent administering the survey from lowering task engagement and the subsequent salience of the manipulation. To encourage them to reflect on the beginning of the final round, I asked them to think about what they were feeling and thinking immediately after receiving the information on the IMAX screens when taking the survey.

Elliot and Church's (1997) scales were used to capture members' perceptions of their own goals and Park and DeShon's (2010) measures were used to quantify members' perceptions of their team's goals. I followed Dweck and Leggett's (1988) advice and modified the items so that they focused on the last round of the simulation. The specific items and their loadings as well as the reliability of the scales are in Tables 2 and 3. Due to individual and team achievement goals loading on the same factors (for example, team and individual mastery goals loading together) but the questions referring to different levels of analysis (Klein et al., 1994), I am displaying the analysis for the individual and team level questions separately.

The Exploratory Factor Analysis (EFA) in Table 2, confirmed that the individual level measures were measuring distinct constructs with eigenvalues that were above the typical cutoff of 1 (eigenvalues = 3.58, 3.22, 1.82; 66% variance explained). Items loaded on factors as predicted by Elliot and Church's (1997) theory (average predicted loading = .79, min = .50, max

= .94) with minimal cross-loadings on other factors (average cross-loading = .04, min = -.18, max = .26). Also, the performance-approach goal (α = .82) and performance-avoidance goal (α = .95) scales had adequate reliability, but the mastery goal scale (α = .64) did not.

I used factor analysis to verify that the team achievement goal measures are getting at distinct constructs. From the Exploratory Factor Analysis (EFA) in Table 3, the eigenvalues were above the typical cutoff of 1 (eigenvalues = 2.87, 2.49, 2.08; 74% variance explained) indicating that the scales captured three different factors. Items loaded on factors as Park and DeShon (2010) predicted (average predicted loading = .85, min = .59, max = .92) with minimal cross-loadings on other factors (average cross-loading = .05, min = -.08, max = .20). Also, the performance-approach goal (α = .89) and mastery goal (α = .76) scales had adequate reliability, but the performance-avoidance goal scale (α = .69) did not.

To verify that the within group agreement warranted using the team level achievement goals, I calculated the ICC(1)'s, ICC(2)'s and $r_{wg(j)}$'s. For all three constructs the $r_{wg(j)}$'s were above the recommended cut-off of .8 (James, Demaree, & Wolf, 1984.). In particular, the $r_{wg(j)}$ for team mastery goals was .96, team performance-approach goals was .88 and team performance-avoidance goals was .86.

However, the ICC's statistics, which use between team differences in the denominators of their fractions, provided mixed support for aggregating the team achievement goals to the team level. This is consistent with the notion that the experimental conditions create within condition homogeneity between groups thereby reducing the ICC's. The one-way analysis of variance (i.e. Kenny & la Voie, 1985) showed that team mastery goals ($F(59, 117) = 1.52$, $p = .03$; ICC1 = .15, ICC2 = .34) and team performance-approach goals ($F(59, 117) = 1.92$, $p < .001$; ICC1 = .24, ICC2 = .48) differed between groups, but team performance-avoidance goals ($F(59, 117) = .81$, p

> .10; ICC1 = -.07, ICC2 = -.24) did not.

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Insert Tables 1, 2 and 3 about here
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For use as control variables, they were also asked demographic information. In particular, they were asked their age, gender and race.

Video coding was used to capture behaviors. I coded information sharing following the same procedure as Park and DeShon (2010) where task relevant utterances were counted. For interdisciplinary collaboration, I mirrored Hoever, van Knippenberg, van Ginkel, and Barkema's (2012) methodology and counted those utterances where information that only one subject got in her material was shared. For voice, coders were asked to count utterances that fit the descriptors provided in Dyne and LePine's (1998) voice scale[4].

I trained the coders by providing them with detailed instructions and rating forms. After talking through the forms, the two coders and I coded two videos together discussing and resolving any discrepancies as we went[5].

The high correlations between coders and the intraclass correlations coefficients indicate high inter-rater reliability for information sharing (r = .93; ICC(1): .93, ICC(2) = .96), interdisciplinary collaboration (r = .88; ICC(1): .71, ICC(2) = .83), and voice (r = .91; ICC(1): .90, ICC(2) = .95). As a result, I averaged their scores for each measure.

Dependent variable. Team decision quality was measured as the percentage of the total amount of possible profit teams achieved in the last round. This was calculated by modifying the equations in Devine et al.'s (2004) simulation to reflect the information in the IMAX memos.

[4] I also asked them to count the number of questions that were asked as well as the amount of talking each member did.

[5] The inclusion or exclusion of these videos from the analysis do not materially impact the results. These videos are included.

Framing Pilot

The framing manipulation was piloted for two reasons. First, it was a low cost way to make sure that the manipulation worked in brief experiments before using it on the longer primary study. Second, supportive results would lessen the need to interrupt the simulation and possibly undermine the manipulation during the primary experiment by administering a survey as a manipulation check part way through the scenario.

***Subjects*.** The piloting involved subjects from Mechanical Turk (MTURK), a web based service that connects researchers with participants that are representative of the larger population (Goodman, Cryder, & Cheema, 2013). MTURK was an effective forum for this piloting because all that subjects needed to do was read a memo, which does not require coming into a lab.

Following Simmons et al.'s advice (2011), I attempted to have 20 subjects in each condition. Assuming that 3 subjects from each condition would fail the information check where they were asked the subject of the memo, I recruited 23 subjects per condition. More of the subjects were engaged than I anticipated resulting in 23 subjects in the opportunity framing condition, 21 in the control condition and 22 in the threat framing condition.

Procedure. Subjects were told that they would be participating in a study about how memos are interpreted. Next, they were asked to imagine that they were on a decision making team for a movie studio and that they had just received a memo from the CEO. Third, they were asked to read the memo. Fourth, they were asked to take a survey about how they interpreted the memo as well as asked the subject of the memo. The latter was used to eliminate respondents who took the survey without reading the memo.

The scale was a combination of the items in Highhouse, Paese, and Leatherberry's (1996) scale as well as the descriptors found in Jackson and Dutton's (1988) paper where they asked

managers to describe strategic threats and opportunities and then they counted word usage in their descriptors. Subjects were asked the extent to which the adjectives describe the impact that IMAX theaters will have on their movie studio (1 = not at all descriptive, 7 = very descriptive). For opportunity framing, the descriptive terms were: "Positive," "May gain and won't lose," "Opportunity," "Better future if resolved," "Boon," "Positive implications for the future," "Worst result is a future that is not worse," and "Gain possible" (α = .86) For threat framing, the descriptive terms were: "Negative," "May lose and won't gain," "Threat," "Crisis," "Negative implications for the future," "Best result is a future that is not worse," and "Loss possible" (α = .89).

CHAPTER 4: RESULTS

The purpose of this chapter is to review and interpret the results of the experiment. In order to do this, I will discuss the results of the pilot study and then the primary experiment. When talking about the results of the primary experiment, I will first highlight some interesting findings in the descriptive statistics. Next, I will discuss the results of my hypothesis tests, which were largely unsupportive of my model.

After that, I will review the sort of findings that are typically considered out of the scope for a Washington University dissertation because they do not directly pertain to the model in the dissertation proposal. More precisely, I will present the results of my post-hoc analysis because I thought that readers might like to know the model that emerged from the data.

Framing Pilot Results

As expected, participants in the three conditions felt IMAX theaters presented different levels of opportunity ($F(2, 63) = 10.73$, $p < .001$) with participants in the opportunity framing condition rating the IMAX theaters as being more of an opportunity ($M = 5.21$, $SD = .75$) than participants in the control ($M = 4.54$, $SD = 1.09$) ($t(43) = 2.18$, $p = .03$) or threat framing conditions ($M =$ 3.81, 1.08) ($t(44) = 4.63$, $p < .001$). IMAX theaters were also seen as more of an opportunity in the control condition than in the threat condition ($t(42) = 2.37$, $p = .02$).

As predicted, participants in the three conditions felt IMAX theaters presented different levels of threat ($F(2, 63) = 15.15$, $p < .001$) with participants in the threat condition rating the IMAX theaters as being more of a threat ($M = 4.75$, $SD = 1.28$) than participants in the control ($M = 3.66$, $SD = 1.03$) ($t(42) = 3.06$, $p < .01$) or opportunity framing conditions (M = 2.83, $SD =$ 1.12) ($t(44) = 5.49$, $p < .001$). IMAX theaters were also seen as more of a threat in the control condition than in the opportunity condition ($t(43) = 2.34$, $p = .02$).

Descriptive Statistics from the Primary Experiment

I constructed two tables to show general trends in the data. Table 4 shows the ANOVA's comparing conditions, as well as each condition's average and confidence interval (CI). Table 5 shows the correlations between the variables. Both tables include variables in the hypothesized model and potential control variables. They also include a variable that was expected but not hypothesized to vary between conditions, perspective taking (more on this later).

An inspection of Table 4 reveals that only two of the hypothesized variables have statistically significant differences between conditions. The dependent variable, decision quality ($F(2, 57) = 8.07$, $p < .001$), is highest in the opportunity framing condition ($M = 95.85$, *95% CI* = [93.32, 98.38). It is lowest in the threat framing condition ($M = 84.36$, *95% CI* = [78.21, 90.51]) but not by a statistically significant margin due to the threat and control conditions ($M = 88.77$, 95% *CI* = [85.52, 92.01]) confidence intervals overlapping.

One of the collaborative behaviors, interdisciplinary collaboration ($F(2, 56) = 17.07$, $p < .001$), is highest in the opportunity framing condition ($M = 42.55$, *95% CI* = [36.99, 48.11]) and lowest in the threat framing condition ($M = 23.90$, *95% CI* =[*18.91, 28.89*]). The control condition's ($M = 28.42$, 95% *CI* = [24.36, 32.49]) confidence interval overlaps with the one from the threat condition.

Table 5 has a few correlations that are worth noting. Consistent with my theory and previous research, teams' mastery goals were positively related to information sharing ($r = .35$, $p < .01$), interdisciplinary collaboration ($r = .34$, $p < .01$), voice ($r = .44$, $p < .01$) and decision quality ($r = .40$, $p < .01$). Also consistent with my theory but contradictory to that of others, the average of members' individual performance-approach goals were also positively related to interdisciplinary collaboration ($r = .26$, $p < .05$) and decision quality ($r = .33$, $p < .05$). The

only behavior that had a significant impact on decision quality was interdisciplinary collaboration ($r = .63$, $p < .01$).

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Insert Tables 4 and 5 about here
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In order to make sure that the results of my primary experiment were not confounded by groups in the opportunity framings condition having higher expectations than those in the other conditions, I asked a subset of teams how well they expected to do in the last round. Results show that expectations did not significantly differ by condition when compared at the team ($F(2,14) = 1.00$, $p > .10$) and individual levels ($F(2,42) = 2.22$, $p > .10$)[6].

Hypotheses Testing

Most of my hypothesis involve some form of comparison between indirect effects. In order to test them, I used the bootstrapping procedures recommended by Preacher and Hayes (Hayes & Preacher, 2014; Preacher & Hayes, 2004; Preacher, Rucker, & Hayes, 2007). More specifically, I used the MEDIATE and PROCESS programs. The MEDIATE program was designed to compare unstandardized indirect path coefficients between experiments with more than two conditions (Hayes & Preacher, 2014) and was used to test hypotheses 1 through 9. The PROCESS program provides a more flexible array of options for testing moderated mediation models and was used for testing hypothesis 11. Both programs use bootstrapping to construct the confident intervals that compare the hypothesized indirect effects. All the confidence intervals were constructed through 10,000 bootstrapped samples.

Hypothesis 10 involved simple moderation. It was tested using ordinary least squares (OLS) regression.

[6] The individual level has less responses than the number of people asked to take the survey because some subjects indicated that they did not know how they expected to do in the last round.

To test the robustness of the partially supported hypotheses, I ran those analysis with a variety of combinations of control variables. For reporting, I followed Becker's (2005) recommendation and reported the analysis without any controls because none of my controls were significantly related to the dependent variable. The inclusion of the controls did not materially impact the results.

It is worth noting that two groups are missing from my tests for hypotheses 1 through 9 and 11 because their videos could not be coded. One video was corrupted and could not be played. The other video was unusable due to a mistake during recording; I hit the record button twice in succession resulting in only the first few seconds of the experiment being recorded.

The results of the hypothesized indirect effects H1(a-c) to H9(a-c) are in Tables 6 and 7. Table 6 contains the indirect effects involving framing (threat and opportunity) impacting collaborative behaviors (information sharing, interdisciplinary collaboration and voice) through achievement goals (average of members' individual and team state mastery, performance-approach and performance-avoidance goals). Table 7 displays the results of the analysis for the indirect effects from achievement goals to decision quality through collaborative behaviors.

To summarize, the majority of the confidence intervals for the indirect effects in both tables included zero. The only exceptions were a positive indirect effect from team mastery goals to decision quality through interdisciplinary collaboration, and a positive indirect effect from the average of members' individual performance-approach goals to decision quality through interdisciplinary collaboration. Simply put, none of my hypotheses were strongly supported. For the sake of thoroughness, I now discuss the results of the tests of each hypothesis in the order in which they were proposed.

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Insert Tables 6 and 7 about here
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Hypothesis 1 states that there are positive indirect relationships between opportunity framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team performance-approach goals. For H1(a), results showed that the indirect effect of opportunity framing on information sharing through the average of members' individual state performance-approach goals was 1.12 with a confidence interval that included zero (*95% CI* = [-.93, 7.81]). They also showed that the indirect effect of opportunity framing on information sharing through team performance-approach goals was .52 with a confidence interval that included zero (*95% CI* = [-1.48, 6.89]). For H1(b), the analysis similarly found that the indirect effect of opportunity framing on interdisciplinary collaboration through the average of members' individual state performance-approach goals was .73 with a confidence interval that included zero (*95% CI* = [-.39, 2.97]). It also showed that the indirect effect of opportunity framing on interdisciplinary collaboration through team performance-approach goals was .36 with a confidence interval that included zero (*95% CI* = [-.34, 2.35]). For H1(c), the analysis showed that the indirect effect of opportunity framing on voice through the average of individual members' state performance-approach goals was .63 with a confidence interval that included zero (*95% CI* = [-.48, 3.99]). It also revealed that the indirect effect of opportunity framing on voice through team performance-approach goals was .42 with a confidence interval that included zero (*95% CI* = [-.62, 3.92]). In sum, H1(a-c) did not receive any support.

Hypothesis 2 predicted that there would be positive indirect relationships between team performance-approach goals and team decision quality through team (a) information sharing, (b) interdisciplinary collaboration and (c) voice. For H2(a), the results showed that the indirect effects from the average of members' individual state performance-approach goals as well as

from team performance-approach goals on decision quality through information sharing were -.12 and -.05 with confidence intervals that included zero (*95% CI's* = [-.87, .12], [-.68, .10]). H2(b), however, received mixed support. The results showed that the indirect effect of the average of members' individual state performance-approach goals on decision quality through interdisciplinary collaboration was 1.28 with a confidence interval that did not include zero (*95% CI* = [.30, 2.69]). However, team performance-approach goal's indirect effect was .65 with a confidence interval that included zero (*95% CI* = [-.40, 2.02]). The results did not support H2(c) by showing that the indirect effects of the average of members' individual and team performance-approach goals on decision quality through voice were .14 and .09 with confidence intervals that included zero (*95% CI's* = [-.15, 1.38], [-.12, 1.28]). In sum, H2(b) received mixed support while H2(a) and H2(c) did not receive any support.

Hypothesis 3 posited that there are negative indirect relationships between threat framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team state performance-avoidance goals. For H3(a), the analysis showed that the indirect effect of threat framing on information sharing through the average of members' performance-avoidance goals was .58 with a confidence interval that included zero (*95% CI* = [-1.23, 6.98]). Similarly, the analysis also found that the indirect effect of threat framing on information sharing through team state performance-avoidance goals was 1.76 with a confidence interval that included zero (*95% C*I = [-1.03, 7.57]). The analysis for H3(b) showed that the indirect effect of threat framing on interdisciplinary collaboration through the average of members' performance-avoidance goals was .31 with a confidence interval that included zero (*95% CI* = [-.52, 3.05]). They also showed that the indirect effect of threat framing on interdisciplinary collaboration through team state performance-avoidance goals was .33 with a confidence interval that included

zero (*95% CI* = [-.36, 2.18]). And for H3(c), the results showed that the indirect effects of threat framing on voice through the average of members' individual and team performance-avoidance goals were .59 and .98 with confidence intervals that included zero (*95% CI* = [-1.04, 4.68], [-.57, 4.94]). In short, H3(a-c) did not receive any support.

Hypothesis 4 made the incorrect prediction that there would be negative indirect effects between team performance-avoidance goals and team decision quality through team (a) information sharing, (b) interdisciplinary collaboration and (c) voice. Results showed that the indirect effects of the average of members' and team state performance-avoidance goals on decision quality through information sharing were -.13 and -.21 with confidence intervals that included zero (*95% CI's* = [-1.56, 0.20]), [-1.55, 0.36]). For H4(b), the results showed that the indirect effects of the average of members' individual and team performance-avoidance goals on decision quality through interdisciplinary collaboration were .02 and .75 with confidence intervals that included zero (*95% CI's* = [-2.71, 2.52]), [-1.41, 2.71]). For H4(c), the indirect effects from the average of members' and team state performance-avoidance goals on decision quality through voice were .48 and .54 with confidence intervals that included zero (*95% CI's* = [-.28, 3.06]), [-.31, 3.23]). In sum, H4(a-c) did not receive any support.

Hypothesis 5 expected to find positive indirect relationships between opportunity framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team performance-avoidance goals. For H5(a), the results showed that the indirect effect of opportunity framing on information sharing through the average of members' individual state performance-avoidance goals was 1.12 with a confidence interval that included zero (*95% CI* = [-.93, 7.81]). They also showed that the indirect effect of opportunity framing on information sharing through team performance-avoidance goals was -.50 with a confidence interval that

included zero (*95% CI* = [--6.23, 1.14]). For H5(b), the results indicated that the indirect effect of opportunity framing on interdisciplinary collaboration through the average of members' individual state performance-avoidance goals was 1.70 with a confidence interval that included zero (*95% CI* = [-1.63, 9.72]). The results also showed that the indirect effect of opportunity framing on interdisciplinary collaboration through team performance-avoidance goals was .28 with a confidence interval that included zero (*95% CI* = [-.42, 2.47]). The analysis for H5(c) was similarly unsupportive with an indirect effect of opportunity framing on voice through the average of members' individual state performance-avoidance goals being -.57 with a confidence interval that included zero (*95% CI* = [-4.33, 1.08]) as well as an indirect effect of opportunity framing on voice through team performance-avoidance goals of .94 with a confidence interval that included zero (*95% CI* = [-.84, 6.07]). In sum, H5(a-c) did not receive any support.

Hypothesis 6 predicted negative indirect relationships from threat framing to team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team state performance-approach goals. For H6(a), the results showed that the indirect effect of threat framing on information sharing through the average of members' individual state performance-approach goals was -.56 with a confidence interval that included zero (*95% CI* = [-6.16, 1.09]). The analysis also found that the indirect effect of threat framing on information sharing through team performance-approach goals was .38 with a confidence interval that included zero (*95% CI* = [-1.12, 5.99]). For H6(b), the results showed that the indirect effect of threat framing on interdisciplinary collaboration through the average of members' individual state performance-approach goals was -.03 with a confidence interval that included zero (*95% CI* = [-2.00, 1.47]) and that the indirect effect of threat framing on interdisciplinary collaboration through team performance-approach goals was .16 with a confidence interval that included zero (*95% CI* = [-

.49, 1.97]). And for H6(c), the results showed that the indirect effect of threat framing on voice through the average of members' individual state performance-approach goals was .18 with a confidence interval that included zero (*95% CI* = [-.84, 2.83]). They also found that the indirect effect of threat framing on voice through team performance-approach goals was .31 with a confidence interval that included zero (*95% CI* = [-.55, 3.57]). In sum, H6(a-c) did not receive any support.

Hypothesis 7 expected to find positive indirect relationships between opportunity framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team mastery goals. For H7(a), the results showed that the indirect effect of opportunity framing on information sharing through the average of members' individual state mastery goals was -.30 with a confidence interval that included zero (*95% CI* = [-6.46, 4.77]) and that the indirect effect of opportunity framing on information sharing through team mastery goals was -.47 with a confidence interval that included zero (*95% CI* = [-5.82, 4.42]). For H7(b), the analysis found that the indirect effect of opportunity framing on interdisciplinary collaboration through the average of members' individual state mastery goals was -.09 with a confidence interval that included zero (*95% CI* = [-2.12, 1.46]) and that the indirect effect of opportunity framing on interdisciplinary collaboration through team mastery goals was -.20 with a confidence interval that included zero (*95% CI* = [-2.65, 1.78]). For H7(c), the results revealed that the indirect effect of opportunity framing on voice through the average of members' individual state mastery goals was -.17 with a confidence interval that included zero (*95% CI* = [-.37, 2.79]). They also showed that the indirect effect of opportunity framing on voice through team mastery goals was -.30 with a confidence interval that included zero (*95% CI* = [-3.78, 2.66]). In short, H7(a-c) was not supported.

Hypothesis 8 received a little support in its prediction that there would be positive indirect relationships between team state mastery goals and team decision making quality through team (a) information sharing, (b) interdisciplinary collaboration and (c) voice. For H8(a), the results showed that the indirect effect of the average of members' individual state mastery goals and team mastery goals on decision quality through information sharing were -.64 and -.84 with confidence intervals that included zero (*95% CI's* = [-2.45, .47], [-2.43, .09]). For H8(b), the analysis indicated that the indirect effect of the average of members' individual state mastery goals on decision quality through interdisciplinary collaboration was 1.90 with a confidence interval that included zero (*95% CI's* = [-.78, 5.30]). However, the results indicated that the indirect effect from team mastery goals through interdisciplinary collaboration to decision quality was 2.38 with a confidence interval that did not include zero (*95% CI* = [.49, 4.41]). For H8(c), the results showed that the indirect effect of the average of members' individual and team mastery goals on decision quality through voice were .74 and .09 with confidence intervals that included zero (*95% CI's* = [-.73, 3.83], [-1.18, 1.89]). In short, H8(a) and H8(c) did not receive any support but H8(b) received mixed support.

Unlike hypothesis 8, hypothesis 9 did not receive any support in its prediction that there would be negative indirect relationships between threat framing and team (a) information sharing, (b) interdisciplinary collaboration and (c) voice through team mastery goals. For H9(a), the results showed that the indirect effect of threat framing on information sharing through the average of members' individual state mastery goals was 1.24 with a confidence interval that included zero (*95% CI* = [-3.97, 7.93]) and that the indirect effect of threat framing on information sharing through team mastery goals was -1.12 with a confidence interval that included zero (*95% CI* = [-7.82, 4.81]). For H9(b), the analysis found that the indirect effect of

threat framing on interdisciplinary collaboration through the average of members' individual state mastery goals was .03 with a confidence interval that included zero (*95% CI* = [-2.14, 1.94]). It also revealed that the indirect effect of threat framing on interdisciplinary collaboration through team mastery goals was -1.08 with a confidence interval that included zero (*95% CI* = [-4.99, 1.16]). And for H9(c), the results showed that the indirect effect of threat framing on voice through the average of members' individual state mastery goals was .73 with a confidence interval that included zero (*95% CI* = [-2.55, 4.37]) and that the indirect effect of threat framing on voice through team mastery goals was -.80 with a confidence interval that included zero (*95% CI* = [-5.15, 2.79]). Therefore, H9(a-c) did not receive any support.

Hypotheses 10(a-c) and 11(a-c) involved an interaction between mastery and performance-approach goals that is theoretically agnostic about which variable is the independent variable and which is the moderator. In Tables 8 and 9 as well as here, I discuss the results with mastery goals as the independent variable because the preponderance of the evidence from the literature supports mastery goals positively impacting team decision quality through collaborative behaviors. However, the results are not materially impacted by which variable is the independent variable and which is the moderator.

Hypothesis 10 predicted that team state mastery and team state performance-approach goals will positively interact in their relationship with team decision quality such that teams that are high on both team state mastery and performance-approach goals. To test this hypothesis, I used a three-step OLS procedure by entering mastery goals, then performance-approach goals, and then the interaction between them as shown in Table 8. The results do not support this hypothesis with the coefficient for the interaction being insignificant when the team achievement goals are conceptualized as the average of members' individual goals ($\beta = -1.80$, $p > .10$) or as

team goals (β = -1.62, p > .10).

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Insert Table 8 about here
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Hypothesis 11 predicted that the relationship that did not receive support in hypothesis 10 would be partially mediated by collaborative behaviors. More specifically, it stated that (a) information sharing, (b) interdisciplinary collaboration and (c) voice will partially mediate the effect that the team mastery by performance-approach goal interaction has on team decision making quality. While testing this hypothesis seems unwarranted because the interaction does not impact the dependent variable, I empirically tested the hypothesis using the moderated mediation analysis discussed above for the sake of thoroughness. The results are in Table 9 and show that the combination of significant indirect and direct effects from the independent variable, mastery goals, at high levels of the moderator, performance-approach goals, do not exist for any of the six combinations of goals and mediators that were tested. Thus, hypotheses 10 and 11 did not receive any support.

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Insert Table 9 about here
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In sum, I attempted to extend current theories to build a model where framing impacts team achievement goals thereby effecting collaborative behaviors to impact team decision quality. However, none of the proposed relationships between framing and achievement goals received support. Instead, the analysis found that teams given an opportunity framing are more engaged in interdisciplinary collaboration and make better decisions. I now turn to a discussion of a cognitive mechanism, perspective taking, that lies between framing and interdisciplinary collaboration and is more strongly supported by the data.

Post-Hoc Analysis

A post-hoc analysis is out of the norm of a dissertation. The prescribed format is one where the dissertation reviews the model from the dissertation proposal and a test of it. However, I am including a brief discussion of the model that was made evident by the data. I am not doing this to extend theory or to say something novel and interesting (i.e. Davis, 1971); I am doing this to inform the reader of an empirically valid model.

After watching the video tapes of the first thirteen groups that ran the experiment, I noticed that the groups that received the opportunity framing manipulation seemed more interested in understanding one another's perspective. To test if that relationship existed, I added items from a perspective taking measure to the post-experiment survey.

Perspective taking, is a desire "to understand, in a nonjudgmental way, the thoughts, motives, and/or feelings of a target, as well as why they think and/or feel the way they do" (Parker, Atanasov, & Axtell, 2008: 151). As noted by Grant and Berry (2011: 83) and demonstrated by Davis and colleagues (Davis, Conklin, Smith, & Luce, 1996), perspective taking is "an intrapsychic or internal psychological process" that should be measured by self-reports and positioned in theoretical models as a cognitive mechanism.

The perspective taking items were modified from Grant and Berry (2011) to focus on figuring out the impact of IMAX screens. More precisely, I asked the subjects the extent to which they agreed or disagreed (1 = strongly disagree, 7 = strongly agree) with "After I learned about the introduction of IMAX screens, I tried to…" "understand my teammates' viewpoints," "take my teammates' perspectives," "see the simulation through my teammates' eyes," "understand what the other team members were thinking," "understand the other team members' viewpoints," "learn the unique information my teammates had and how they applied it," "learn what my teammates knew about the simulation," and "understand my teammates' information"

($\alpha = .94$).

After I was done collecting data, I noticed that perspective taking varied between conditions ($F(2, 44) = 9.75$, $p < .001$). It is the highest in the opportunity framing condition ($M = 6.14$, *95% CI* = [5.93, 6.36]). And the lowest in the threat framing condition ($M = 4.81$, *95% CI* =[4.26, 5.36]) with a confidence interval that overlaps with that of the control condition ($M = 5.29$, *95% CI* = [4.78, 5.80]). Moreover, perspective taking, was also positively related to a collaborative behavior that impacted decision quality, interdisciplinary collaboration ($r = .63$, $p < .01$), and to decision quality ($r = .80$, $p < .01$).

These findings and perspective taking being a cognitive mechanism provides initial evidence that framing impacts perspective taking thereby influencing interdisciplinary collaboration and ultimately decision quality. To test this path more robustly, I used the PROCESS program (Model 6; Hayes, 2012) following the recommended coding structure (Hayes & Preacher, 2014) and specified as well as found support for a model where opportunity framing increased teams' perspective taking, which increased interdisciplinary collaboration thereby improving decision quality; the unstandardized coefficient is .85 with a 95% confidence interval that does not include zero (*95% CI* = [.22 to 2.45]). However, the indirect path coefficient from threat framing was only significant at the 90% level. The unstandardized coefficient for the path starting at threat framing is -.59 with a 95% confidence interval that includes 0 (*95% CI* = [-2.37 to .03]) but a 90% confidence that does not (*90% CI* = [-2.13, -.05). The results of that analysis are displayed in Figure 2 and their implications are discussed in the next chapter.

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Insert Figure 1 about here

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CHAPTER 5: DISCUSSION

I set out to build an empirically supported model where opportunity and threat framings influence team decision making through team achievement goals. That support was largely absent from the data. The parts of the model that were backed by the analysis include partial support for the proposed impact of two of the six measures of team achievement goals on decision making quality. More precisely, the analysis found that team mastery goals and the average of members' individual performance-approach goals improve decision quality by increasing interdisciplinary collaboration. The analysis also found that opportunity framing increases interdisciplinary collaboration and team decision quality. But my model received no support for the part linking framing to achievement goals, which naturally leads to two questions: Why not? And if scholars want to find an actionable antecedent to team achievement goals, what should they do differently?

In terms of the former question, the answer likely falls into at least one of three broad categories where the proposed relationships between framing and achievement goals (1) did not occur because the theory was wrong, (2) would have been found in a different context or (3) existed but my measures did not pick up on them.

The last possibility is fairly easy to explore. The most obvious weakness in my achievement goal measures is that I did not ask the participants their goals until after the simulation was complete. This may have resulted in them failing to accurately recall their goals making those measures too noisy to detect any patterns. If this reason is right, it is unlikely that any of the cognitive mechanisms would have varied by the framing condition. However, perspective taking did vary between conditions making this reason unlikely.

The second reason could be that the ability of framing to impact achievement goals was

constrained by the context. Research on task contexts gives some credence to this possibility. Three aspects of the task may have encouraged teams to develop stable achievement goals before they received the framing manipulation thereby limiting the manipulations' ability to impact those goals. First, the complexity of the simulation may have increased mastery goals. The literature on task enrichment shows that complex tasks result in people being more invested in learning (Hackman & Oldham, 1980; Oldham & Baer, 2012). Given that mastery goals are the prioritization of learning, this implies that two rounds of working on the simulation may have made the teams higher on mastery-goals before they got the framing manipulation. Second, the performance improvements that occurred between the first and second rounds for most teams may have resulted in those teams being high on performance-approach as well as low on performance-avoidance goals. Elliot and McGregor (2001) find that positive feedback increases students' valuation of their competence thereby increasing their performance-approach goals and decreasing their performance-avoidance goals. And third, task based discussion like the teams engaged in for an hour before receiving the framing manipulation can result in teams developing stable achievement goals that are difficult to change (Dragoni, 2005; Kim et al., 2012). Combined this implies that teams may have developed difficult to influence achievement goals before receiving the framing manipulation thereby limiting its ability to impact those goals.

If the task constrained the ability of framing to have the intended effect, the data would likely show small differences in achievement goals in the predicted direction. This was the case for four of the six measures of achievement goals. And if the task increased performance-approach as well as mastery goals but lowered performance-avoidance goals, performance-avoidance goals would be lower than performance-approach and mastery goals. This was also the case. Together this provides some directional evidence to the notion that framing would have impacted

achievement goals in another context.

The last possibility is that the proposed relationship between framing and achievement goals does not exist because the theory is wrong. This possibility has some credence. A careful re-reading of the research on achievement goals reveals two problems with my theory. First, achievement goals are triggered by a constellation of aligned antecedents and my theory only focused on one antecedent. Second, framing may trigger task specific goals instead of superordinate goals like achievement goals.

The implications of the first flaw in my theory are similar to those just discussed for the context constraining the impact of frames. Ames (1992: 268) states that the antecedents of achievement goals "are mutually dependent on each other and interact in a multiplicative manner." This suggests that there is not a single unmitigated driver of team achievement goals. Instead, achievement goals are predicted by a constellation of interacting antecedents implying that my theory's failure to incorporate contingencies into it resulted in a model that failed to capture the complexity of the phenomena. If this is the case, an appropriate test of the model would only find insignificant differences in the predicted direction because the necessary enablers were not measured or manipulated. The data provides some support to this notion with four the six achievement goal measures being in the predicted direction albeit insignificantly.

The second problem with my theory was that it may not have matched framing with right type of goal. As noted by Dweck (1992), there are two types of goals that impact behaviors. The first type is "the outcomes individuals are striving for, the standard of performance they seek to attain" (Dweck, 1992: 165). These goals are triggered by outcome related cues. The second type is "the higher level, more superordinate classes of goals that are behind the particular outcomes individuals strive for" (Dweck, 1992: 165). These goals are primed by cues related to

innate needs. Achievement goals fall into the latter type.

Because threat and opportunity framing are outcome related cues (Jackson & Dutton, 1988), they should be associated with the former type of goal instead of the latter. If that is true, it implies that a task-specific priority should vary with framing. And opportunity framing as well as perspective-taking research imply that perspective-taking is a task-specific motive that is predicted by opportunity framing. More specifically, Dutton (1992) proposes that opportunity framing increases peoples' interest in obtaining new information and different interpretations to better understand an issue. Relatedly, perspective taking is motivated by interest in comprehending varying viewpoints to try to accurately and holistically understand an issue (Epley, Keysar, Van Boven, & Gilovich, 2004). Moreover, perspective-taking is a task-specific motive in the task context of decision making because it involves trying to understand an issue to make a better decision (Hoever et al., 2012; van Knippenberg, De Dreu, & Homan, 2004). This logic implies that perspective-taking should be increased by opportunity framing, which is what happened; perspective-taking was significantly higher in the opportunity framing (M = 6.14, *95% CI* = [5.93, 6.36]), than the threat (M = 4.81, *95% CI* = [4.26, 5.36]) and the control conditions, (M = 5.29, *95% CI* = [4.78, 5.80]).

In sum, the data provides some support to the notion that the theory was too simple resulting in a test that failed to capture necessary complexities. More precisely, the theory neglected the full constellation of antecedents that must align resulting in a method that only manipulated one antecedent and found small effects. However, the results lend even more credence to the idea that frames impact relevant task-specific motives, such as perspective-taking, instead of superordinate motives, such as achievement goals, by showing significant differences in perspective-taking but not achievement goals between conditions.

While framing's impact on perspective taking clearly furthers the framing literature by showing how opportunity and threat framings impact teams' motives, behaviors and decision quality, it does little for the achievement goal literature. This is unfortunate because achievement goals have important ramifications for teams. Therefore, scholars should work to find an actionable antecedent to team achievement goals. In order to help with this, I address the second question I posed – if scholars want to find an antecedent for team achievement goals, what should they do differently? – by discussing the implications of my theory's two primary flaws.

First, researchers should measure many potential antecedents and analyze how they work together to capture the necessary complexity. The achievement goal literature states that achievement goals are predicted by an array of antecedents that must align (Ames, 1992) suggesting that the impact of one antecedent is dependent on the presence of others. Therefore, researchers only capturing one or a few antecedents are unlikely to find what drives achievement goals or to develop models that are too simple to be accurate.

While researchers should capture multiple antecedents, the specific way they do this depends on the methodology. For field research, studies should try to capture as many antecedents as theoretically justifiable and then use that data to develop contingent effects models. For lab studies, the interdependence between the antecedents implies that this research must be careful to control as many antecedents as possible and to design studies that manipulate multiple antecedents in order to capture the direct effects and their qualifying factors.

When researchers are hypothesizing about the antecedents they should capture, they should make sure that their focal variables are associated with higher-level motives. In other words, the antecedent should be a reason behind doing the task instead of being task-specific. This sort of

careful construct mapping will improve researchers' chances of building theoretically sound and empirically supported models.

Fortunately, Ames's (1992) investigations in classrooms provide an excellent starting point for doing this. As discussed above, this researcher found that the antecedents of students' achievement goals fit into three broad categories: 1. the nature of the task; 2. student evaluations; 3. the behaviors of authority figures. In the next few paragraphs, I will build on Ames's (1992) findings to propose manipulations for each category of antecedent for each of the three achievement goals. The focal context will continue to be decision making teams.

For the first category of antecedent, Ames (1992) finds that task complexity increase mastery goals. And Winters and Latham (1996) have developed a manipulation to increase the complexity of a task without changing its nature - by increasing the number of factors that must be considered to make a decision. This implies that increasing the number of factors that a team must consider to make a decision should increase its team mastery goals by increasing task complexity.

While Ames (1992) finds that mastery goals are impacted by the nature of the task, Elliot and McGregor (2001) find that performance goals are effected by how well people think they will do at a task relative to others. More specifically, they demonstrate that one's perceived competence on a task relative to others predicts their performance goals with high normative expectations predicting performance-approach goals and low normative expectations predicting performance-avoidance goals. Moreover, past performance predicts future expectations (Bandura, 1982). This implies that a multi-decision task with false normative feedback would manipulate performance-approach and –avoidance goals. One way to do this would be have teams do a multi-round simulation like the one used in this dissertation but where they are told their relative

performance between rounds. In this situation, Elliot and McGregor's (2001) work suggests that when teams are told that the decisions they made in the previous round put them in a high percentile that they would be higher on performance-approach goals. But when they are told their decision put them in a low percentile that they would be higher on performance-avoidance goals.

The second type of antecedent that Ames (1992) finds is how people are evaluated. Luckily, Van Yperen (2003) already built on those findings to make a manipulation for individual achievement goals that can easily be modified for decision making teams. Consistent with definition of mastery goals, Van Yperen (2003) increases subjects' mastery goals by telling them that their evaluation is based on their improvement over time. This should work for teams by modifying that manipulation to be about team performance improvements. Van Yperen (2003) increases individuals' performance goals by telling them that they will be evaluated relative to other individuals. Given that performance-approach goals are about positive relative evaluations, I propose that telling teams that they should try to do better than other teams will increase their performance-approach goals. And building on Van Yperen's (2003) manipulation as well as the definition of performance-avoidance goals, I suggest that team performance-avoidance goals will be increased by telling teams that they should try not to perform worse relative to other teams.

The last category that Ames (1992) finds is the behaviors of authority figures. She demonstrates that teachers who facilitate students being involved in their own and their class's decision making have students who are higher on mastery goals. This implies that leaders of decision making teams who behave similarly should increase their teams' mastery goals. When leaders attempt to facilitate participative discussion, they are signaling to members that they have

input into the decision and should explore the issue (Miner, 1979; Vinokur, Burnstein, Sechrest, & Wortman, 1985). I posit that this cue results in members being higher on mastery goals for two reasons. First, by showing members that they influence the decision, leaders are showing members that learning about the issue will impact the decision. And people tend to be higher on mastery goals when they think that learning will make a difference. Second, research on power demonstrates that members tend to adopt their leaders' goals (Keltner, Gruenfeld, & Anderson, 2003). And leaders are suggesting to members that they are taking mastery goals when they engaging in behaviors consistent with mastery goals such as exploring an issue. This implies that team mastery goals can be manipulated by having fictitious leaders attempt to facilitate participative discussion.

Inversely, teachers making decisions for students increase students' performance goals (Ames, 1992). I build on this finding to propose that how fictitious leaders use their authority to advocate for a decision will impact teams' performance-approach or -avoidance goals. Combining this with performance-approach goals focusing on higher normative evaluations suggests that a fictitious leader telling his/ her teams that agreeing with him/ her will result in higher relative evaluations will be an effective manipulation for performance-approach goals. And given that performance-avoidance goals are about preventing lower normative evaluations, I suggest that a fictitious leader telling his/ her team that agreeing with him/ her will prevent a poor relative standing will manipulate teams' performance-avoidance goals.

In sum, my proposed model was likely incorrect because it only focused on one antecedent to team achievement goals and that antecedent was task specific instead of associated with higher-level wants. Fortunately, I also measured a task-specific cognitive mechanism, perspective taking, which resulted in a model with theoretical and practical implications that I will discuss

now.

THEORETICAL CONTRIBUTIONS

As just discussed, the cognitive mechanism between opportunity framing and interdisciplinary collaboration was perspective taking instead of the achievement goals I predicted. Like achievement goals, perspective taking is an important cognitive mechanism. Van Knippenberg et al. (2004) argue that it is the key to unlocking the potential of functional diversity because members must have a desire to understand one another's thinking in order to integrate and leverage the variety of knowledge that comes from different backgrounds. Perspective taking is also shown to have a host of important results. For individuals, engagement in perspective taking reduces social categorization (Galinsky & Moskowitz, 2000) as well as increases creativity (Grant & Berry, 2011) and emotional regulation (Parker et al., 2008). In teams, it is shown to improve creativity (Hoever et al., 2012), which some argue is the key to decision making teams providing competitive advantages to their companies (West & Anderson, 1996).

However, research is only now starting to investigate perspective taking in teams and has not demonstrated how to increase perspective taking or perspective taking's impact on decision making. Both of these areas of research are important. For a mechanism such as perspective taking to result in better outcomes for practitioners, practitioners must know how to influence it. And for that mechanism to be worth influencing, it must effect important outcomes.

My dissertation extends team perspective taking research by helping with both of these. First, I find that framing an issue as an opportunity increases team perspective taking. Second, I show that perspective taking improves team decision quality, which is an important outcome.

Moreover, this model integrates the theories underlying the framing and perspective taking

literatures. The former suggests that opportunity framing increases the extent to which individuals want to understand an issue (Dutton, 1992). And the latter implies that engaging in perspective taking is a way that people on multifunctional teams work to understand an issue and that it predicts behaviors that improve team decision making (van Knippenberg et al., 2004).

The perspective taking literature is not the only area of research this dissertation furthers; it improves five other areas of research as well. First, it extends the team decision making literature by showing how to get teams to make sense of new and ambiguous information. Despite decision making teams frequently needing to make decisions using these inputs, they tend to struggle under these circumstances and the management literature offers little guidance on how to get teams to engage in helpful cognitive processes and behaviors (Cronin, Weingart, & Todorova, 2011; Kerr & Tindale, 2004). My dissertation addresses this shortcoming by demonstrating that teams make sense of new and ambiguous information when that news is framed as an opportunity.

Second, it helps extend the team and organization learning literature. The organization learning literature is built on the premise that organizations and teams learn in order to respond to change (Cyert & March, 1963). And changes are mainly framed as threats or opportunities (Mintzberg et al., 1976). However, this literature does not show us if the way a change is framed impacts the extent to which multifunctional teams engage in a fundamental learning behavior, interdisciplinary collaboration. I combine those observations and show that framing impacts interdisciplinary collaboration thereby creating a new model that can be used for studying organizational and team learning.

Third, my dissertation improves the cognitive framing literature (Dutton & Jackson, 1987) by identifying cognitive and behavioral mechanisms, perspective taking and interdisciplinary

collaboration, through which these characterizations impact team decision quality. Moreover, I conducted the first empirical test of framing theory at the team level. Doing this furthers the practical significance of this literature by bringing the modern reality that most organizations make their strategic decisions through teams into it.

Fourth, my dissertation helps to fill an important gap in the knowledge diversity literature by finding a way to get members to engage in thinking and behaviors that help them take advantage of their different viewpoints and backgrounds. More specifically, I find that opportunity framing encourages members to become more invested in perspective taking. And that members act on this interest by engaging in interdisciplinary collaboration thereby improving decision quality.

Fifth, my dissertation questions the belief in the achievement goal literature that performance goals universally undermine collaboration. More precisely, I find a situation where performance-approach goals actually increase interdisciplinary collaboration by studying a context where teams must act cooperatively to do well, decision making. Consistent with the other research the chair of this dissertation and I have conducted (Sanner & Bunderson, In press), this also highlights the importance of management theories explicitly incorporating context in to them by showing that an assumed universal truth is reversed in certain contexts.

PRACTICAL IMPLICATIONS

The clearest managerial implication of my dissertation is that managers should introduce ambiguous and complex issues as opportunities to their teams because doing so increases decision quality. Moreover, my dissertation suggests that framing will be particularly impactful for functionally diverse teams because the thinking and behaviors it heightens, perspective taking and interdisciplinary collaboration, are more important for those teams.

The second practical implication is that teams prioritizing positive outcomes is not

necessarily bad for collaboration. As discussed above, research frequently presumes that performance focused teams do not learn or engage in the productive behaviors associated with high quality decision making. However, I demonstrate that performance-approach goals can increase interdisciplinary collaboration in a context where those behaviors are necessary for success. For managers, this suggests that emphasizing positive outcomes can actually aid in collaborative behaviors when teams must engage in them to do well.

NEXT STEPS

The most interesting and strongly supported part of the model is framing's impact on decision quality through interdisciplinary collaboration. While perspective taking was shown to be the cognitive mechanism between framing and interdisciplinary collaboration, that finding is problematic because subjects were asked about their perspective taking after the experiment was over.

In order to see if there were other more methodologically sound mechanisms between framing and interdisciplinary collaboration, I re-watched and took notes on the videos. After I was done, I reviewed my notes and a pattern emerged from them. An abridged version of the notes for the first few minutes of the final round for the six best performing teams in the opportunity condition and six worst performing teams in the threat performing condition are in Table 10. And the model that is suggested by those notes is in Figure 2.

As can be seen in the notes, the pattern that emerged is one where the teams that were given an opportunity frame tried to make sense of the change through discussion, the development of heuristics for incorporating IMAX screens into their decision making process, and the utilization of routines for organizing information. However, teams in threat framing seemed to want to rush to make a decision by making recommendations and advocating for decisions.

Combining these qualitative observations with the quantitative data suggests different paths from opportunity and threat framing to decision quality. More specifically, the opportunity framing teams that were higher on sensemaking were subsequently higher on interdisciplinary collaboration and ultimately made better decisions. However, the threat framing teams' desire to get closure on decisions seemed to be associated with them discussing shared instead of unshared information and making poorer decisions.

Both of these paths have precedent in the literature. Previous studies show that opportunity framing is positively associated with trying to understand why a change occurred as well as rethinking aspects of a situation (Taylor, 1983). Moreover, people who view a change as an opportunity engage in more adaptive behaviors and try to find ways to grow and develop (Taylor & Armor, 1996). These behaviors are all consistent with sensemaking in that all of them are focused on trying to understand ambiguous circumstances. And on multifunctional teams, continuing to try to make sense of an issue requires interdisciplinary collaboration, which ultimately improves decision quality.

Threat framing resulting in teams rushing to make a decision and acting maladaptive also has theoretical justification. Research shows that perceiving situations as threatening results in groups wanting to quickly make a decision without searching (Turner, Pratkanis, Probasco, & Leve, 1992) or deliberating (Kamphuis, Gaillard, & Vogelaar, 2011), which results in discussing shared information instead of utilizing differences (Gardner, 2012).

Fortunately, both of my proposed paths can be tested using another wave of video coding. To get a fine grained idea of what happened, all measures except one of the new sensemaking measures will be captured by counting the number of times members engaged in behaviors by minute over the first five minutes of the final round. Those behaviors are comments about

IMAX's impact to the team's strategy and its implications, questions and general IMAX comments. Because sequential interactions (A, B then C speak) are a way that teams systematically reduce ambiguity (Argote, Turner, & Fichman, 1989; Stachowski, Kaplan, & Waller, 2009; Waller, 1999), I will ask the coders to count them too. For decision advocacy, the only behaviors that will be counted is the number of decision recommendation made. I will also ask coders to note the time of the first recommendation and the time the first movie was selected (Multiple movies are selected per round; coders will continue to watch past the first 5 minutes until this happens).

CONCLUDING COMMENTS

The critical importance of teams making high quality decisions in order for their organizations to perform well is widely recognized. It is also well established that issues are mainly presented to teams as threats or opportunities. However, research is yet to demonstrate if this framing impacts the manner with which teams make decisions thereby impacting the quality of their decisions. This is important to understand because people are hardwired to engage in threat and opportunity framing, which makes it an inevitable aspect of team decision making. And if framing impacts team decision making, research revealing if and how framing has that effect can help managers strategically use a naturally occurring tendency.

My dissertation helps with this by calling on a variety of literatures and the expertise of scholars from Washington University in St. Louis and the University of Groningen. The model that emerged suggests that opportunity framing improves team decision quality by increasing interdisciplinary collaboration due to teams being higher on perspective taking. This improved understanding of the interpretive pathway contributed to six different literature streams and has a very clear implication for managers; when in doubt, it's an opportunity.

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TABLES

Table 1: Rotated Factor Pattern and Loadings for Individual Achievement Orientations from Pre-survey

	Component		
	Performance-approach	Performance-avoid	Mastery
Loadings			
Eigenvalue	3.07	2.70	2.57
% of Variance	23.58	20.79	19.80
Cumulative % of variance	23.58	44.37	64.18
Items			
I think that it's important to show others how good you are when you succeed	**.89**	.13	.01
It's important for me to prove that I am better than others on the tasks I do	**.87**	.07	.04
To be honest, I really like to prove my ability to others	**.79**	.03	.02
It's important that others know that I am good at something	**.74**	.27	.01
I prefer to avoid situations where I could risk performing poorly	.19	**.81**	-.13
I would rather write a report on a familiar topic so that I can avoid doing poorly	-.04	**.74**	-.10
I undertake tasks that I feel that I will probably do well at	.06	**.74**	.09
I am more concerned about avoiding low marks than I am about learning	.22	**.64**	-.29
I would rather try to get out of a difficult task than be perceived as bad at it	.45	**.59**	-.14
I like tasks that really force me to think hard	.07	-.14	**.83**
I'm willing to take on difficult tasks if I can learn a lot by doing them	-.04	.11	**.80**
I prefer challenging and difficult tasks so that I'll learn a great deal	.14	-.14	**.76**
I truly enjoy learning for the sake of learning	-.11	-.21	**.72**

Note: Coefficients in bold indicate that the items were developed to assess this factor.

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 2: Rotated Factor Pattern and Loadings for Team Achievement Goals during the Final Round of the Simulation

	Component		
	Performance-approach	Performance-avoid	Mastery
Loadings			
Eigenvalue	2.87	2.49	2.08
% of Variance	28.71	24.91	20.84
Cumulative % of variance	28.71	53.62	74.45
Items			
It was important for us to do better than other teams	**.92**	.08	.12
Our goal was to get a better grade than most of the other teams	**.91**	.04	.14
My goal was to get a better grade than most of the other teams	**.88**	-.08	.15
It was important for us to do well compared to other teams	**.59**	.07	-.03
Our goal was to avoid performing poorly	-.01	**.91**	-.01
We just wanted to avoid doing poorly in this exercise	.06	**.90**	-.01
Our fear of performing poorly was what motivated us	.06	**.89**	.02
My team hoped to gain broader and deeper knowledge of the movie industry	.14	.17	**.84**
My team wanted to learn as much as possible about how IMAX screens would impact movie studios	-.04	-.08	**.83**
My team seemed to prefer it when material really challenged us so we can learn new things	.20	-.08	**.80**

Note: Coefficients in bold indicate that the items were developed to assess this factor.

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 3: Rotated Factor Pattern and Loadings for Individual Achievement Goals during the Final Round of the Simulation

	Component		
	Performance-approach	Performance-avoidance	Mastery
Loadings			
Eigenvalue	3.58	3.22	1.82
% of Variance	27.56	24.73	13.96
Cumulative % of variance	27.56	52.30	66.26
Items			
My goal was to get a better grade than most of the other teams	**.94**	.01	.03
I strove for us to demonstrate higher ability relative to other teams	**.94**	.02	.05
It was important to me to do better than the other teams	**.92**	.03	.08
I was motivated by the thought of outperforming the other teams	**.91**	.03	.00
My fear of us performing poorly was what motivated me	.04	**.82**	.05
I just wanted us to avoid doing poorly in this exercise	.03	**.78**	.04
I worried about the possibility of us getting a bad score	.15	**.76**	.03
I was afraid that if we do something 'dumb,' others might not think we're smart	.00	**.74**	-.03
I thought to myself, 'What if we do badly in this exercise?'	.08	**.73**	.02
I wished this exercise was not evaluated	-.18	**.50**	.13
I wanted to learn as much as possible about how IMAX screens would impact movie studios	.04	.02	**.87**
It was important for me to understand how IMAX screens would impact movie studios	-.12	-.02	**.85**
I hoped to gain a broader and deeper knowledge of the movie industry	.26	.18	**.54**

Note: Coefficients in bold indicate that the items were developed to assess this factor.

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4: Comparison between Conditions using Team Averages, Confident Intervals and ANOVAs

	Anova		Threat			Control			Opportunity		
				95% CI			95% CI			95% CI	
	F	*p*	Mean	Lower	Upper	Mean	Lower	Upper	Mean	Lower	Upper
Decision quality final round	8.07	.00	84.36	78.21	90.51	88.77	85.52	92.01	95.85	93.32	98.38
Decision quality 2nd round	.86	.43	81.66	77.57	85.75	85.51	81.18	89.84	82.32	76.91	87.74
Decision quality 1st round	.07	.94	77.12	72.45	81.79	78.53	73.40	83.66	77.66	70.33	84.99
Information sharing	.88	.42	93.29	80.59	105.99	83.13	72.80	93.47	89.70	78.49	100.91
Interdisciplinary collaboration	17.28	.00	23.90	18.91	28.89	28.42	24.36	32.49	42.55	36.99	48.11
Voice	.51	.60	42.50	35.77	49.23	40.92	36.13	45.71	45.00	38.59	51.41
Mastery goals (individual)	.01	.99	4.72	4.37	5.07	4.71	4.47	4.95	4.69	4.41	4.97
Mastery goals (team)	.49	.61	4.27	3.77	4.77	4.52	4.22	4.81	4.45	4.14	4.76
Performance-approach goals (individual)	.82	.44	4.35	3.74	4.95	4.31	3.75	4.87	4.77	4.18	5.35
Performance-approach goals (team)	.55	.58	4.41	3.61	5.22	4.22	3.69	4.75	4.68	4.12	5.24
Performance-avoidance goals (individual)	.87	.42	3.21	2.89	3.54	3.03	2.74	3.32	2.94	2.62	3.27
Performance-avoidance goals (team)	.65	.52	4.41	3.61	5.22	4.22	3.69	4.75	4.68	4.12	5.24
Perspective taking	9.75	.00	4.81	4.26	5.36	5.29	4.78	5.80	6.14	5.93	6.36
Mastery orientation	1.37	.26	5.55	5.26	5.85	5.28	5.09	5.46	5.49	5.21	5.77
Performance-approach orientation	1.60	.21	5.00	4.49	5.52	4.48	3.99	4.97	4.60	4.25	4.95
Performance-avoidance orientation	.10	.90	4.63	4.26	5.01	4.53	4.27	4.79	4.57	4.20	4.94
Age (years)	.36	.70	19.25	18.89	19.61	19.35	19.01	19.69	19.44	19.14	19.75
Age standard deviation	.67	.52	.61	.39	.82	1.24	.01	2.47	1.28	.13	2.43
Gender (# of females)	2.09	.13	1.40	.96	1.84	.90	.53	1.27	1.40	.96	1.84
Race (Blau's index)	.33	.72	.31	.19	.42	.33	.21	.45	.37	.26	.47
Expected final round performance (% of possible)	1.00	.39	78.17	65.16	91.17	87.67	82.17	93.17	77.83	59.88	95.79
GPA	.20	.82	3.53	3.40	3.65	3.52	3.37	3.66	3.47	3.33	3.62
GPA coef var	1.48	.24	65.53	.54	130.51	23.19	11.42	34.96	23.59	12.84	34.34
Graduation (# of semesters including summer)	.35	.71	8.15	7.11	9.19	8.38	7.39	9.37	7.81	6.78	8.84
Graduation coef var	.38	.69	2.83	2.65	3.02	2.88	2.71	3.05	2.77	2.58	2.96

Note: For all variables except perspective taking, information sharing, interdisciplinary collaboration and voice, N = 60. For information sharing, interdisciplinary collaboration and voice, N = 58. For perspective taking, N = 47.

Table 5: Correlations

	Condition[1]	Age	Age coef var	Gender	Race diversity	GPA	GPA coef var	Graduation	Graduation coef var	Mastery Orient	Perf-Ap Orient	Perf-Av Orient
Age	.11											
Age coef var	.14	.24										
Gender[2]	.00	-.01	-.04									
Race diversity[3]	.11	.18	.29*	.08								
GPA	-.08	-.40**	-.18	.33*	-.10							
GPA coef var	.13	.33*	.26	.16	.14	-.40**						
Graduation[4]	-.07	-.70**	-.22	.13	-.10	.54**	.31					
Graduation coef var	-.07	-.68**	-.21	.15	-.10	.54**	.29	.99**				
Mastery Orientation	-.05	-.06	-.01	-.12	.25	-.05	.19	-.28*	-.29*			
Perf-Ap Orientation	-.18	-.25	-.13	.07	-.08	.08	.01	.07	.04	.12		
Perf-Av Orientation	-.04	-.06	-.08	-.06	-.22	.13	-.08	.02	.00	-.20	.55**	
Mastery goal (ind)	-.02	-.04	.08	-.01	.00	.09	.13	.05	.04	.11	.21	.06
Mastery goal (team)	.09	-.05	.07	-.10	.08	.02	.14	.14	.13	.01	.02	.03
Perf-Ap goal (ind)	.14	-.09	-.01	-.06	-.01	.01	.12	-.02	-.05	.16	.58**	.51**
Perf-Ap goal (team)	.08	.00	.01	-.12	.02	-.06	.05	-.04	-.07	.17	.57**	.50**
Perf-Av goal (ind)	-.17	-.01	-.05	.26*	.25	.08	-.09	.10	.10	.10	.17	.15
Perf-Av goal (team)	-.02	.04	-.05	.08	.10	.10	.15	-.02	-.03	.14	.04	.24
Perspective taking	.55**	.10	-.05	.05	-.14	-.12	-.11	-.16	-.14	.09	.01	-.06
Information sharing	-.06	-.16	-.01	.10	-.04	.18	.361*	.17	.16	.349*	-.04	-.04
Interdisc Collab	.59**	.02	.12	.05	.05	-.17	-.18	-.02	-.01	.04	.00	.03
Voice	.08	-.11	-.02	.08	-.04	.11	-.01	.14	.13	.22	-.05	-.06
Decision quality R1	.02	-.13	.04	.06	.10	-.03	-.04	.08	.07	.12	.18	.06
Decision quality R2	.03	.20	.09	.12	.10	.09	-.20	-.11	-.11	-.02	.16	.17
Decision quality final	.47**	.09	.10	.00	.01	-.10	-.26	-.15	-.14	-.16	.05	.10

	Mastery goal (ind)	Mastery goal (team)	Perf-Ap goal (ind)	Perf-Ap goal (team)	Perf-Av goal (ind)	Perf-Av goal (team)	Perspective taking	Info sharing	Interdisc Collab	Voice	Decision quality R1	Decision quality R2
Mastery goal (team)	.76**											
Perf-Ap goal (ind)	.39**	.41**										
Perf-Ap goal (team)	.30*	.27*	.86**									
Perf-Av goal (ind)	.10	.05	.17	.22								
Perf-Av goal (team)	.05	.05	.24	.27*	.71**							
Perspective taking	.19	.23	.16	.16	-.12	-.14						
Information sharing	.35**	.35**	.15	.08	.14	.28*	.10					
Interdisc Collab	.19	.34**	.26*	.15	.00	.09	.63**	.29*				
Voice	.39**	.44**	.17	.11	.23	.290*	.30*	.84**	.37**			
Decision quality R1	.16	.15	.10	.06	.18	.11	-.06	.13	.14	.13		
Decision quality R2	-.01	.10	.23	.19	.11	.15	-.09	.02	-.03	.06	.05	
Decision quality final	.23	.40**	.33*	.30*	-.05	-.06	.80**	-.07	.63**	.14	.06	.01

Notes:

1. In the correlation table, conditions are coded -1 for threat, 0 for control and 1 for opportunity

2. Gender is count of females

3. Race diversity is calculated using Walsh (1988) recommended adaption of Blau (1977) index

4. Graduation is the average number of semesters until graduation including summer sessions

^p < .10, *p < .05, **p < .01

For all variables except perspective taking, information sharing, interdisciplinary collaboration and voice, N = 60. For information sharing, interdisciplinary collaboration and voice, N = 58. For perspective taking, N = 47.

Table 6: Indirect Effects of Framing on Collaborative Behaviors through Achievement Goals

		Threat			Opportunity		
			95 % CI			95 % CI	
Mediator	Dependent variable	Indirect effect	Lower	Upper	Indirect effect	Lower	Upper
Mastery (ind)	Info sharing	1.24	-3.97	7.93	-.30	-6.46	4.77
Mastery (team)	Info sharing	-1.12	-7.82	4.81	-.47	-5.82	4.42
Perf-Ap (ind)	Info sharing	-.56	-6.16	1.09	1.12	-.93	7.81
Perf-Ap (team)	Info sharing	.38	-1.12	5.99	.52	-1.48	6.89
Perf-Av (ind)	Info sharing	.58	-1.23	6.98	-.56	-6.23	1.14
Perf-Av (team)	Info sharing	1.76	-1.03	7.57	1.70	-1.63	9.72
Mastery (ind)	Interdisc collab	.03	-2.14	1.94	-.09	-2.12	1.46
Mastery (team)	Interdisc collab	-1.08	-4.99	1.16	-.20	-2.65	1.78
Perf-Ap (ind)	Interdisc collab	-.03	-2.00	1.47	.73	-.39	2.97
Perf-Ap (team)	Interdisc collab	.16	-.49	1.97	.36	-.34	2.35
Perf-Av (ind)	Interdisc collab	.31	-.52	3.05	-.24	-2.99	.49
Perf-Av (team)	Interdisc collab	.33	-.36	2.18	.28	-.42	2.47
Mastery (ind)	Voice	.73	-2.55	4.37	-.17	-.37	2.79
Mastery (team)	Voice	-.80	-5.15	2.79	-.30	-3.78	2.66
Perf-Ap (ind)	Voice	.18	-.84	2.83	.63	-.48	3.99
Perf-Ap (team)	Voice	.31	-.55	3.57	.42	-.62	3.92
Perf-Av (ind)	Voice	.59	-1.04	4.68	-.57	-4.33	1.08
Perf-Av (team)	Voice	.98	-.57	4.94	.94	-.84	6.07

Note: Confidence interval from 10,000 bootstrapping samples. Effects are unstandardized.

Table 7: Indirect Effects of Achievement Goals on Decision Quality through Collaborative Behaviors

			95 % CI	
Independent variable	Mediator	Indirect effect	Lower	Upper
Mastery (ind)	Info sharing	-.64	-2.45	.47
Mastery (team)	Info sharing	-.84	-2.43	.09
Perf-Ap (ind)	Info sharing	-.12	-.87	.12
Perf-Ap (team)	Info sharing	-.05	-.68	.10
Perf-Av (ind)	Info sharing	-.13	-1.56	.20
Perf-Av (team)	Info sharing	-.21	-1.55	.36
Mastery (ind)	Interdisc collab	1.90	-.78	5.30
Mastery (team)	Interdisc collab	2.38	.49	4.41
Perf-Ap (ind)	Interdisc collab	1.28	.30	2.69
Perf-Ap (team)	Interdisc collab	.65	-.40	2.02
Perf-Av (ind)	Interdisc collab	.02	-2.71	2.52
Perf-Av (team)	Interdisc collab	.75	-1.41	2.71
Mastery (ind)	Voice	.74	-.73	3.83
Mastery (team)	Voice	.09	-1.18	1.89
Perf-Ap (ind)	Voice	.14	-.15	1.38
Perf-Ap (team)	Voice	.09	-.12	1.28
Perf-Av (ind)	Voice	.48	-.28	3.06
Perf-Av (team)	Voice	.54	-.31	3.23

Note: Confidence interval from 10,000 bootstrapping samples. Effects are unstandardized.

Table 8: Ordinary Least Square Regression for Team Decision Quality

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	71.99**	70.13**	35.72	67.38**	63.65**	35.91*
Mast goal (ind)	3.75^	1.98	9.75			
Perf-app (ind)		2.29*	10.39			
Mast*Perf-ap (ind)			-1.80			
Mast goal (team)				5.05**	4.34**	10.99*
Perf-ap (team)					1.55^	8.43^
Mast*Perf-ap (team)						-1.62
F	3.15^	4.30*	1.61	11.16**	2.88^	2.42
Adj. R^2	.04	.09	.10	.15	.17	.19

Note: ^p < .10, *p < .05, **p < .01; N = 60

Table 9: Indirect and Direct Effects of Mastery Goals on Decision Quality through Collaborative Behaviors

			Indirect effects						Direct effects		
			-1 S.D. of moderator			.+1 S.D. of moderator					
				95% CI			95% CI			95% CI	
I.V.	Moderator	Mediator	Effect	Lower	Upper	Effect	Lower	Upper	Effect	Lower	Upper
Mastery (ind)	Perf-app (ind)	Info Sharing	-.42	-2.33	.30	-.83	-3.42	.49	2.15	-2.33	6.63
Mastery (ind)	Perf-app (ind)	Interdisc collab	1.72	-1.32	5.49	.11	-4.33	4.66	1.86	-1.60	5.31
Mastery (ind)	Perf-app (ind)	Voice	.53	-.46	3.65	.90	-.79	4.85	.77	-3.77	5.31
Mastery (team)	Per-app (team)	Info Sharing	-.51	-2.41	.16	-1.18	-3.76	.10	4.39	1.08	7.70
Mastery (team)	Per-app (team)	Interdisc collab	2.16	-.45	4.58	2.45	-.59	5.48	2.77	.09	5.45
Mastery (team)	Per-app (team)	Voice	.06	-.88	1.77	.11	-1.48	2.36	3.47	-.04	6.98

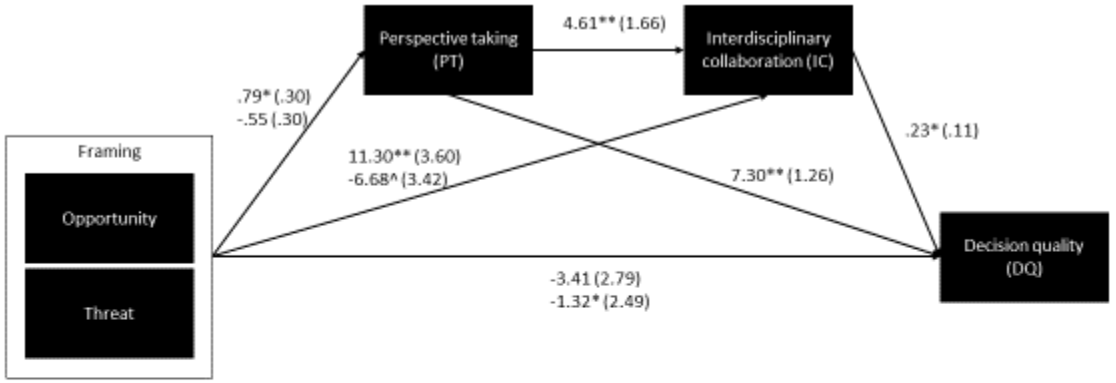
Note: Confidence interval from 10,000 bootstrapping samples. Effects are unstandardized.

Table 10: Observations from Beginning of Last Round for Best Performing Teams in the Opportunity Condition and Worst Performing Teams in the Threat Condition

Opportunity	Threat
Asked questions about impact of IMAX Discussed unshared information Ignored movie descriptions (shared information) Explored options Recommendations started after 5 minutes of discussion	Ignored IMAX Worked frenetically jumping between movies Made first movie selection 2 minutes into discussion
Organized information and then talked through each aspect of each movie refraining from judgment Asked general questions Recommendation started after 8 minutes of discussion Created a high-level IMAX strategy	Talked about movie descriptions and not data Made initial recommendations in 2 minutes and did not discuss non-recommended movies Made blanket generalization about IMAX
Talked high-level strategy and metrics they thought mattered the most Used organized process for going through movies Discussed implications of picking movies but not what to pick Recommendation started after 12 minutes of discussion	Read movie discerptions (shared information) and not data Ignored IMAX screens and unshared information until a member asked about it near end Recommendations started within 1st minute of discussion
Discussed impact of IMAX screens Used organized process for discussing each movie Started off with questions Recommendations started after 5 minutes of discussion	Talked about details of IMAX but not impact or strategy Went almost immediately to bucketing movies as “in” or “out” Mentioned sticking with what had done before
Used organized process for discussion each movie Asked questions Recommendation started after 10 minutes	Mentioned sticking with what had done before Decided on a movie within first 2 minutes of talking
Talked through high-level strategy Used organized process for discussing each movie and IMAX’s impact on it Bucketed movies (promising, maybe, and no) as discussed them	Focused discussion on movie packets (shared information) Decided on a movie within first 2 minutes Discussion focused on ruling movies in or out instead of information about them

FIGURES

Figure 1: Mediation Analysis



Indirect path	Effect	SE	95% CI lower	95% CI upper
Opportunity framing → PT → DQ	5.76	2.10	2.34	10.65
Opportunity framing → PT → IC → DQ	.85	.50	.22	2.45
Opportunity framing → IC → DQ	2.60	1.59	.42	7.09
Threat framing → PT → DQ	-3.98	2.86	-10.42	.87
Threat framing → PT → IC → DQ	-.59	.56	-2.37	.03
Threat framing → IC → DQ	-1.54	.93	-4.19	-.23

Notes: Numbers on paths are unstandardized direct effects with errors in parenthesis. Paths from framing are presented with opportunity on top of threat. Confidence intervals from 10,000 bootstrapping samples.

^p<.10. *p < .05. **p < .01.

Figure 2: Model Proposed for Post-Dissertation Testing